TX-SPS-8
~~Filer~~

Brent Rauhut Engineering Inc.

7 November 1996

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: Final Report - Construction of SPS-8 Project (4808) on FM-2223 in Brazos County, Texas

Dear Monte,

Enclosed is the Final Report for the Specific Pavement Studies (SPS-8) project on FM-2223 in Brazos County, Texas. This report documents the construction of the Environmental Study test sections at this location, as well as the monitoring of the project to date.

Please feel free to contact me should you have any questions or comments regarding any of the information included in this report.

Sincerely,

Jerry F. Daleiden, P.E.
Project Engineer, SRCO

JFD:dmj

Enclosure: As stated.

c.w/Enc: Elias Rmeili, TXDOT-Bryan Dist.
Catherine Hejl, TXDOT-Bryan Dist.
Gary Graham, TXDOT-Austin
John E. Nichols, FHWA-Austin
John Miller, PCS/LAW-Kennesaw, GA

c.w/o Enc:Brent Rauhut, SRCO

Morris Reinhardt, RE/SRCO

8240 Mopac, Suite 220 • Austin, Texas 78759 • (512) 346-0870 • FAX (512) 346-8750

FINAL REPORT

SPS-8 PROJECT 4808: ENVIRONMENTAL EFFECTS IN THE ABSENCE OF HEAVY LOADS FM-2223, EASTBOUND BRAZOS COUNTY, TEXAS

FHWA/LTPP

SOUTHERN REGION COORDINATION OFFICE

October 1996

BRENT RAUHUT ENGINEERING INC.

8240 Mopac, Suite 220 • Austin, Texas 78759 • (512) 346-0870 • FAX (512) 346-8750

FINAL REPORT

SPS-8 PROJECT 4808: ENVIRONMENTAL EFFECTS IN THE ABSENCE OF HEAVY LOADS FM-2223, EASTBOUND BRAZOS COUNTY, TEXAS

FHWA/LTPP

SOUTHERN REGION COORDINATION OFFICE

October 1996

TABLE OF CONTENTS

PAGE

LIST OF FIGURES

LIST OF TABLES

FINAL REPORT - SPS-8 PROJECT 4808

STUDY OF ENVIRONMENTAL EFFECTS IN THE ABSENCE OF HEAVY LOADS FM-2223, EASTBOUND BRAZOS COUNTY, TEXAS

INTRODUCTION

As part of the Strategic Highway Research Program's (SHRP) Long Term Pavement Performance (LTPP) Studies, sections of highway 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 FM-2223 in Brazos County, Texas, 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 FM-2223

This project was first offered for consideration by the State of Texas in May 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 9 May 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 21 June 1995.

Specific Experiment Design for FM-2223

Plans for this project were prepared by Catherine Hejl, P.E., of the Texas Department of Transportation (Texas DOT), Brazos County Area Office. The title sheet, typical sections, and layout for this particular project are included as Figures 1, 2, and 3, respectively.

The subgrade for this project is considered to have very active clays. 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 FM-2223 in Brazos County, Texas (See Appendix C). Preconstruction sampling focused on collection of bulk samples from each of the various pavement layers. All sampling was conducted by the Texas DOT with the actual testing work being performed by Buchanan/Soil Mechanics, Inc.

CONSTRUCTION

The following text details any and all unusual features relating to the construction and completion of the asphalt test sections on FM-2223 in Brazos County, Texas for inclusion in LTPP's SPS-8 study. For the purposes of discussion here, "unusual" features will be defined as that information

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]																			
			W E T						D R Y													
			FREEZE			NO-FREEZE			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	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.

INDEX OF SHEETS

SHEET NO DESCRIPTION

SEE SHEET NO 2 FOR INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT CSR 2130-1-7

NET LENGTH OF PROJECT= 34 846 00 FT = 6 599 MI

FM 2223
BRAZOS COUNTY

FROM OSR TO FM 974

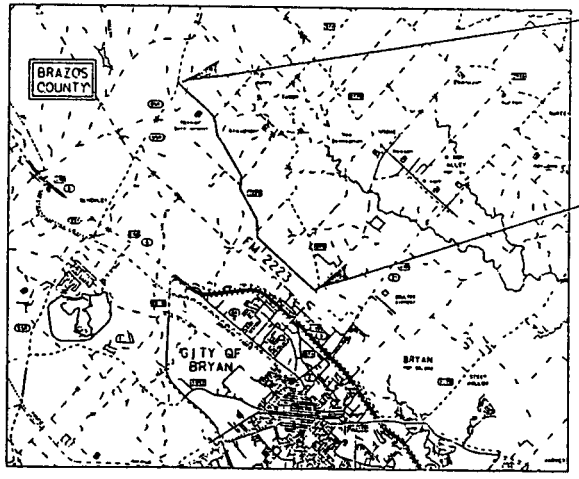
CONSTRUCTION OF REHABILITATION OF EXISTING ROAD
CONSISTING OF SCARIFYING EXISTING BASE LIME TREATING EXISTING BASE
ADDING FLEXIBLE BASE SURFACE TREATMENT, STRUCTURES PAVEMENT MARKINGS AND MARKERS

		CSR 2130-1-7	
DIST	COUNTY		
ENG	BRYAN	BRAZOS	
CONT	SEC	JOB	HIGHWAY NO
2130	01	007	FM 2223

DESIGN SPEED = 40 MPH
DESIGN ADT = 2490
DESIGN YEAR = 2013
EXISTING ADT= 1250

FINAL PLANS

CONTRACTOR:
DATE CONTRACTOR BEGAN WORK:
DATE WORK WAS COMPLETED AND ACCEPTED:
FINAL CONTRACT COST $



BEGIN PROJECT CSR 2130-1-7
BEGIN CONTROL 2130-01-007
STA 0-13 00
REF MARK 402 0 00

END PROJECT CSR 2130-1-7
END CONTROL 2130-01-007
STA 348 59 00
REF MARK 408+0 599

NO EQUATIONS
NO EXCEPTIONS
NO RAILROAD CROSSINGS

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION MARCH 1 1993 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECT S1000 0131

LAYOUT SCALE: 0 5 MILES

TEXAS DEPARTMENT OF TRANSPORTATION

CORRECT 3/29 1995
AREA ENGINEER

RECOMMENDED FOR LETTING 3/30 1995
DIRECTOR OF PLANNING AND DEVELOPMENT

RECOMMENDED FOR LETTING 4-5 1995
DIRECTOR OF TRAFFIC OPERATIONS

APPROVED FOR LETTING:
DIRECTOR OF TRAFFIC OPERATIONS DIVISION

APPROVED FOR LETTING 5-18-95
DEPUTY DIRECTOR

COUNTY BRAZOS PROJ NO
HWY NO LETTING DATE
DATE PLOTTED

CSR 2130-1-1
Brazos

4

FIGURE 1. TITLE SHEET

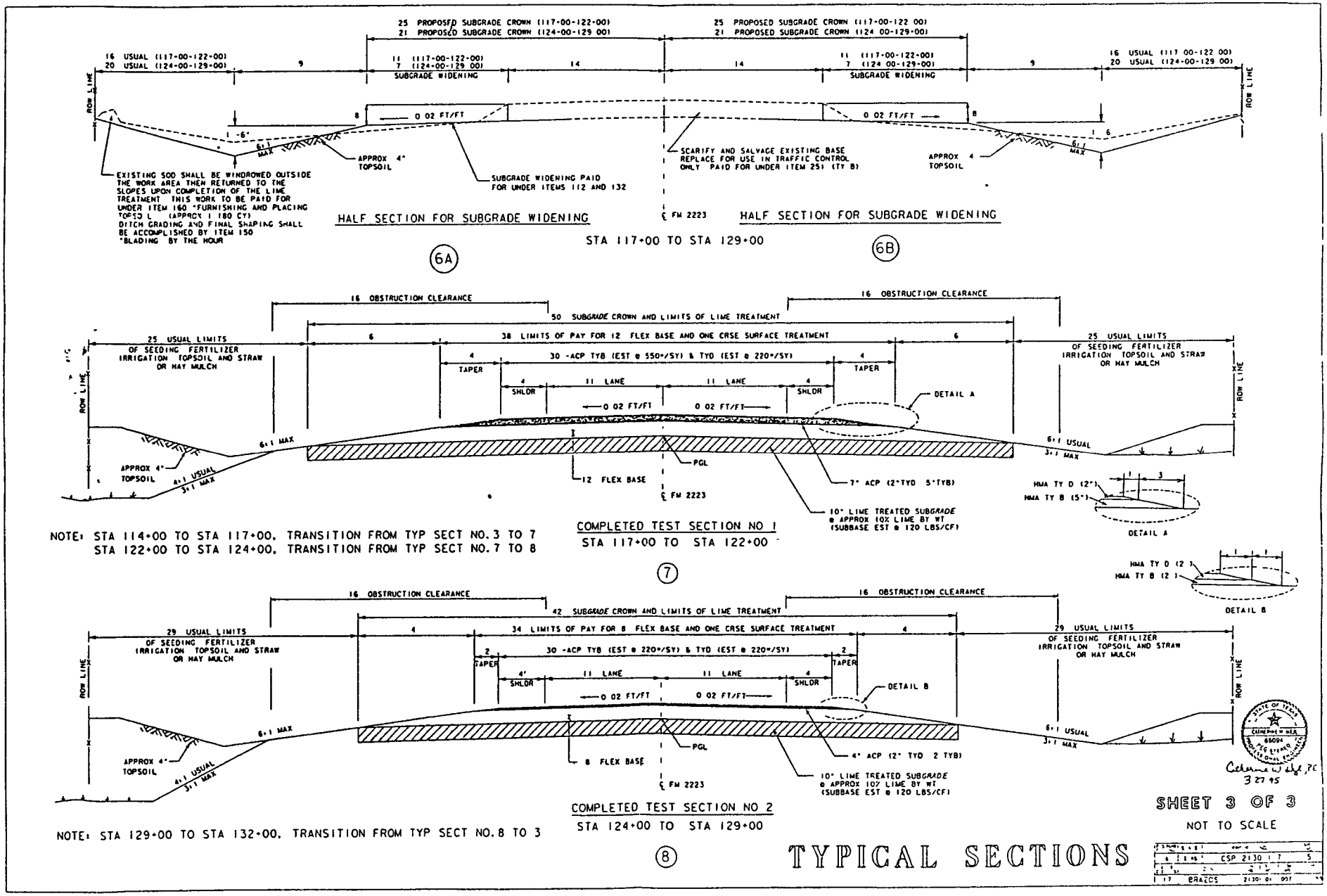


FIGURE 2. TYPICAL SECTIONS

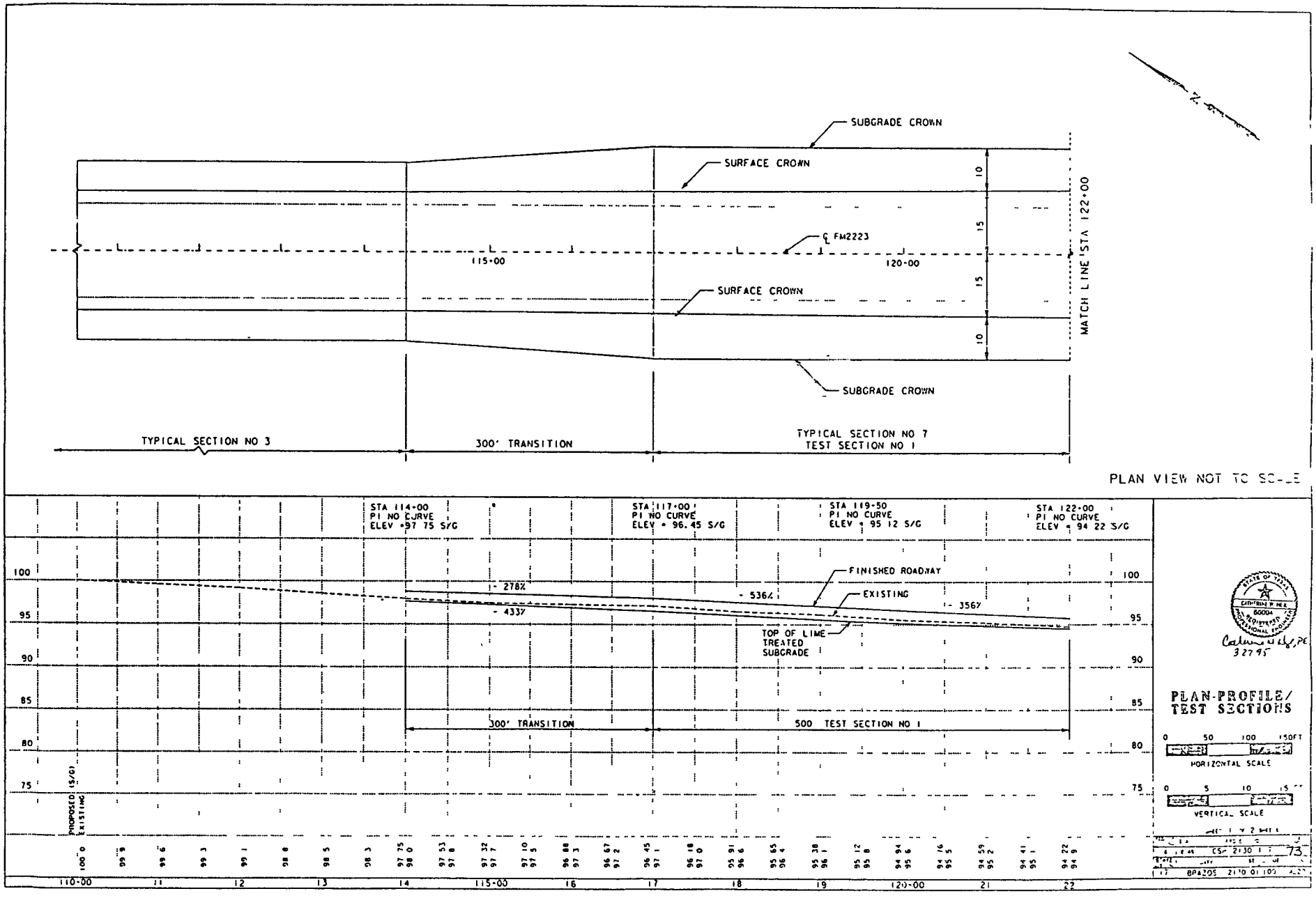


FIGURE 3. SITE LAYOUT

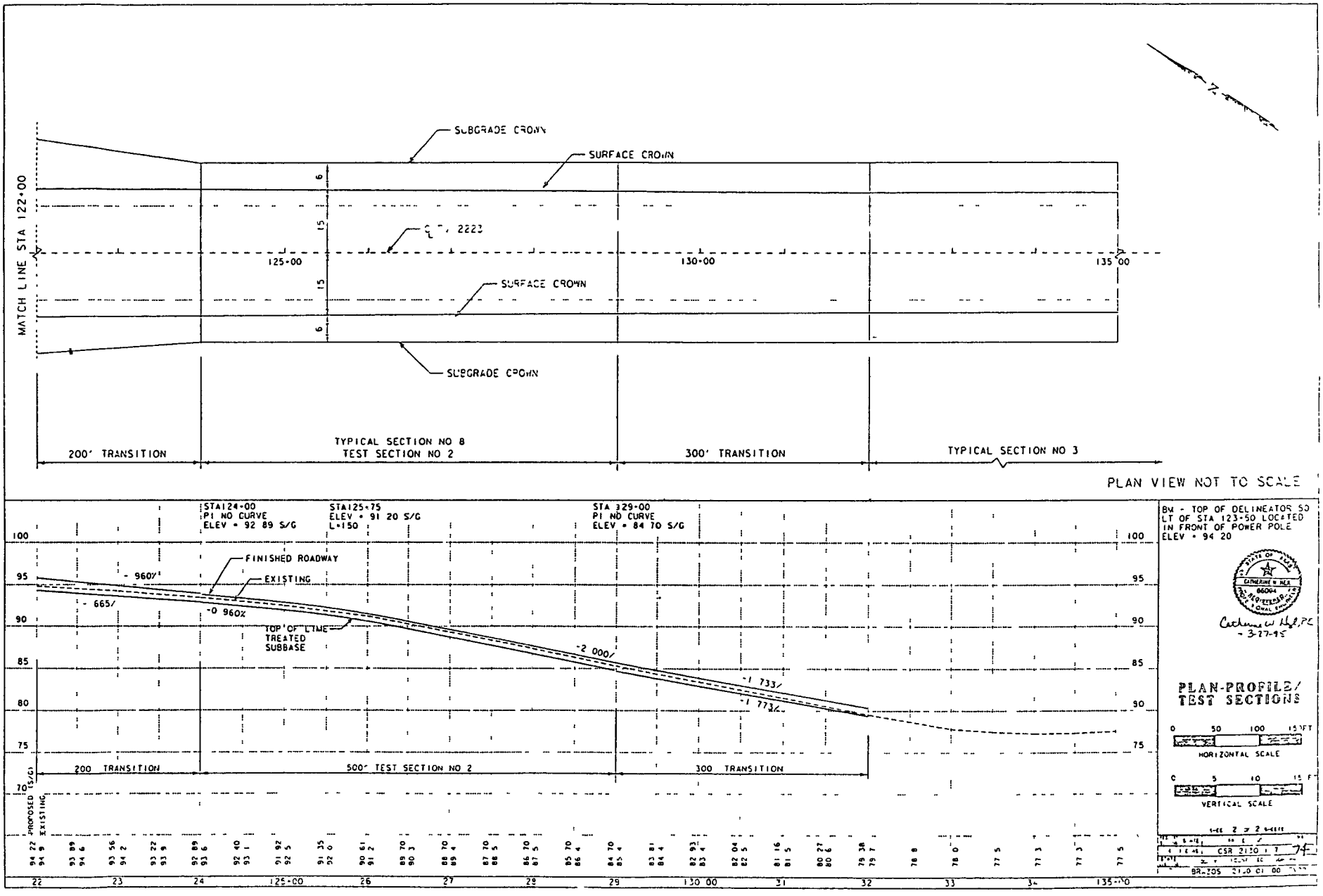


FIGURE 3. SITE LAYOUT (Continued)

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 E.

The project (State Project CSR2130-1-7) extends from Old Spanish Road (OSR) to FM-974, for a total project length of 6.6 miles. The project is just north of Bryan, Texas in Brazos County. The project was let to Southern State Equipment, Inc. in September 1995. At the preconstruction meeting on 15 November 1995, the contractor noted that they were electing to delay the construction associated with our test sections (including the Automatic Weather Station (AWS) until early Spring 1996). Their primary concerns expressed at this meeting were associated with the AWS and its installation. No significant concerns were expressed regarding the construction of these test sections, in fact, the contractor was fairly confident that these sections would only take one to two weeks to construct.

In March 1996, work began on the SPS-8 test sections beginning with the initial lime treatment of the clay subgrade on 7 March 1996. Collection of the subgrade samples (and lime-treated subgrade subbase) was accomplished at this time. Final mixing was performed 13 March and the compaction was completed that same day.

Initiation of work on the DGAB was begun 5 April 1996. Rod and level shots were taken on the surface of the lime-treated subgrade just ahead of the placement of the first layers of DGAB. The first 4-inch lift of DGAB was placed 6 April, the second lift on 11 April and the third lift (for Section 2) was placed 20 April. Rod and level shots taken on the surface of the DGAB (25 April) 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, both sections had almost the same thicknesses of base material (on average). After considerable discussion amongst the State, contractor and SRCO personnel, the sections were re-shot and rechecked for thickness on 22 May and all parties agreed to attempt the necessary corrections to address the deviations noted. The 8-inch base section (480801) was easily cut to reduce the base thickness back to the 8 inches desired (or as close as reasonably possible). Low spots on the 12-inch base (Section 480802) were scarified, watered down and additional material was added and mixed in to attempt to bring the thicknesses up to the desired 12 inches. Under most normal construction operations, establishment of the grade at the beginning of the construction operations would have normally precluded problems like this from occurring. Evidently this grade line was messed up at some point in the construction process. Unfortunately, making correction of unbound granular base thickness after the fact, as was attempted on this project, is extremely challenging. 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.

After the third set of rod and level shots on top of the DGAB were taken on 6 June, it was agreed that this may be as close as these sections would get to the desired base thicknesses and the contractor was allowed to place a seal coat on the finished granular base surface to control water infiltration and serve as a primer prior to the placement of the asphalt concrete layers.

On 16-17 July, placement of the hot mix asphalt concrete was completed. Interestingly enough, from reviewing the profile summaries provided in Appendix C, the thickness variation in the hot mix surface appears to be as dramatic as the variability noted for the base. What's more, these thickness deviations appear to offset one another, providing a total thickness fairly close to that originally specified. This would almost lead one to believe that errors were made in the measurement of the elevations on top of the DGAB, however, three separate sets of readings were taken on three different occasions by three different pairs of surveyors, with comparable results on all three surveys.

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 spread out over several months. Delays in the construction included weather (rain), problems achieving densities and construction sequencing. These two test sections were less than one-half mile of this almost seven-mile job. For the remainder of the project, three one-course surface treatments were placed over 13 inches of flexible base. These additional issues are particularly noteworthy, as traffic was carried on this small FM road throughout construction.

With the completion of the AWS installation in mid-September, all work at this project was complete. 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 14 August.

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 FM-2223 in Brazos County, Texas, 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 Texas Department of Transportation. In particular, much of the credit is due to the help of Elias Rmeli and Ray Latham from the Bryan District office and Catherine Hejl from the Area Engineer's office.

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 AND APPROVAL CORRESPONDENCE

Brent Rauhut Engineering Inc.

30 June 1995

Mr. Gary Graham, D8P
Highway Design Division
Texas Department of Transportation
125 East 11th Street
Austin, Texas 78701-2483

Subject: Approval of SPS Nominations

Dear Gary,

Attached is the approval for the SPS-9A project in San Antonio and the SPS-8 project in Bryan. Please note the incentive funds available. As I'm sure you are aware, these funds can be obtained through John Nichols at the FHWA Division office.

Feel free to contact me if I can be of any assistance. Thank you again for all your help in the nomination of these project.

Sincerely,

Jerry F. Daleiden, P.E.
Project Engineer, SRCO

JFD:dmj

Attachments: As stated.

c.w/Att: Patrick Downey, TX-DOT/San Antonio Dist.
Elias Rmeili, TX-DOT/Bryan Dist.
John E. Nichols, FHWA/TX-Div.
Morris Reinhardt, RE/SRCO
Brent Rauhut, SRCO/File

From: Monte Symons (MSYMONS)
To: MREINHARDT
Date: Wednesday, June 21, 1995 2:52 pm
Subject: SPS Project Nominations

Morris,

I know I'm late in getting this information to you but I want to make sure everyone is aware of the status of the nominations from the Southern LTPP Region. The following is the status of all nomination received as of 6-21-95:

1. AL SPS-6 on I-59 in Etowah county - This project has been approved for inclusion into the LTPP experiment. Incentive funds of $30,000 (FY-95 funds) will be made available to the DOT through the FHWA Division office.

2. TX SPS-9A on FM-1604 near San Antonio - This project is approved for inclusion into the LTPP experiment. Incentive funds of $30,000 (FY-95 funds) will be made available to the DOT through the FHWA Division office.

3. TX SPS-8 on FM 2223 in Brazo county - This project is approved for inclusion into the LTPP experiment. Incentive funds of $30,000 (FY-96 funds) will be available through the FHWA Division office after Oct. 1, 1995.

4. FL SPS-9A on I-10 in Columbia county - This project is approved for inclusion into the LTPP experiment. Incentive fund of $30,000 (FY-95 funds) will be made available through the local FHWA Division Office.

Brent Rauhut Engineering Inc.

9 May 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: Texas SPS-8 Nomination

Dear Monte,

Enclosed are the nomination forms for the SPS-8 project to be located on FM-2223 north of Bryan, Texas, in Brazos County, as we had previously discussed. In anticipation of this nomination, we have reviewed the proposed location with Texas DOT personnel, assisted in their plan preparation and coordinated with all parties involved to facilitate the development of this project. This is a two-lane farm to market (FM) road on moderately active clays, which should make significant contributions to the LTPP studies.

This project is scheduled for an August letting and hence your early attention to this nomination would be greatly appreciated. If there is any additional information you require, please let us know. Thank you for your consideration in this matter.

Sincerely,

Jerry F. Dal[redacted] P.E.
Project Engineer, SRCO

JFD:dmj

Enclosure: As stated.

c.w/Enc: Gonzalo Rada, PCS/LAW
Gary Graham, TX-DOT/D8P
Elias Rmeili, TX-DOT/Bryan Dist.
Brent Rauhut, SRCO
B.F. Templeton, TX-D0T
John E. Nichols, FHWA/TX Div.
Morris Reinhardt, RE-SRCO

Texas Depart
DEWITT C GREER STATE HIGHWAY BU

Post-it® Fax Note 7671 | Date 5/9 | # of pages ▶ 4
To Jerry Daleiden | From John Nichols
Co./Dept Brent Rowbut | Co FHWA
Phone # | Phone #
Fax # 346-8750 | Fax #

May 8, 1995

NAME	INFO	ACTN	COPY
BR	✓		
MG	✓		
MR	✓		
JR		✓	
File:			

RECEIVED
MAY 8 1995
FHWA
Texas Division

Mr. Morris Reinhardt
Southern Region Engineer
Long Term Pavement Performance
8420 MoPac, Suite 250
Austin, Texas 78759

Nomination of an SPS-8 Section in Brazos County

Dear Mr. Reinhardt:

We are offering a project on FM 2223 in Brazos County of our Bryan District as a candidate SPS-8 section (Specific Pavement Section) for incorporation into the Long Term Pavement Performance studies of the Strategic Highway Research Program (SHRP). This proposed section is on FM Road 2223 in Brazos County, between FM 974 and the Old San Antonio Road. The SPS-8 section will study the "Environmental Effects in the Absence of Heavy Loads". A copy of the SHRP SPS nomination form completed by the Bryan District, is attached.

Please contact Elias Rmeili, P.E.,the Bryan District Pavement Engineer, at 409/778-9797, and Gary L. Graham, P.E., of the Design Division, at 512/467-5926, to assist with coordination or for assistance with any questions or comments.

Sincerely,

Original Signed by B. F. Templeton, P.E.

B. F. Templeton, P.E.
Assistant Executive Director
Field Operations

Attachment

cc: Wm. G. Burnett, P.E.
Robert Cuellar, P.E.
John Nichols, P.E., FHWA
Lonny G. Traweek, P.E. Bryan District Engineer
Elias Rmeili, P.E. Bryan District Pavement Engineer
Gary L. Graham, P.E. Design Division

SPS-8 Nomination Form/10 July 91

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

STATE Texas SHRP SECTION NO. 4808

PROJECT LOCATION

ROUTE NUMBER 2223

ROUTE SIGNING [ ] Interstate [ ] U.S. [ ] State [ ] County
Other Farm to Market Road (FM)

PROJECT LOCATION Start Reference Marker 402+0.0 End Reference Marker 408+0.6
Start Milepost _____ End Milepost _____

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

PROJECT LOCATION DESCRIPTION From FM 974 To Old San Antonio Road

COUNTY Bexar
HIGHWAY AGENCY DISTRICT NUMBER 17
SHRP ENVIRONMENTAL ZONE
[ ] Wet Freeze [X] Wet No-Freeze [ ] Dry Freeze [ ] Dry No-Freeze

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

TYPE OF ACTIVITY DEGREE OF ACTIVITY

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

SIGNIFICANT DATES

LATEST DATE OF APPROVAL NOTIFICATION FROM SHRP	June 95
CONTRACT LETTING DATE	August 95
ESTIMATED CONSTRUCTION START DATE	October 95
ESTIMATED DATE TEST SECTIONS OPENED TO TRAFFIC	March 96
ESTIMATED CONSTRUCTION COMPLETION DATE	October 96

PROJECT DESCRIPTION

PROJECT TYPE [ ] New Route [X] Removal and Reconstruction
[ ] Parallel Roadway

Other _____

DESIGN TRAFFIC DATA

ANNUAL AVERAGE DAILY TRAFFIC (TWO DIRECTIONS)	1500
% HEAVY TRUCKS AND COMBINATIONS (OF AADT)	6%
ESTIMATED 18K ESAL RATE IN STUDY LANE (1,000 ESAL/YR)	12.5
TOTAL DESIGN 18K ESAL APPLICATIONS IN DESIGN LANE	250,000
DESIGN PERIOD (Years)	20

SPS-8 Nomination Form/10 July 91

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

STATE Texas SHRP SECTION NO. 4808

AGENCY'S PAVEMENT STRUCTURE DESIGN FOR SITE

LAYER[1] NO.	LAYER[2] DESCRIPTION CODE	MATERIAL TYPE[3] CLASS CODE	THICKNESS (INCHES)	STRUCTURAL[5] COEFFICIENT
1	07	51	—	M_R = 4000 PSI
2	06	42	10.0	0.10
3	05	23	13.0	0.14
4	03	71	0.5	—
5	—	—	—	—
6	—	—	—	—
7	—	—	—	—
8	—	—	—	—
9	—	—	—	—

STRUCTURAL DESIGN METHOD [ ] 1972 AASHTO [ ] 1986 AASHTO. [X] Modified AASHTO
Other Texas Flexible Pavement Design System

AASHTO DESIGN RELIABILITY FACTORS R= 95 S= 0.44

OUTSIDE SHOULDER TYPE

[ ] Turf [ ] Granular [·] Asphalt Concrete [X] 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 Texas SHRP SECTION NO. 4808

TEST SECTION LAYOUT

NUMBER OF TEST SECTIONS ENTIRELY ON: FILL 0 CUT 0

SHORTEST TRANSITION BETWEEN CONSECUTIVE TEST SECTIONS (Feet). 0

VERTICAL GRADE (Avg %) (+ upgrade; - downgrade) 0

HORIZONTAL CURVATURE (Degrees) [ ] Tangent 0

COMMENTS ON DEVIATIONS FROM DESIRED SITE LOCATION CRITERIA None

OTHER SHRP TEST SECTIONS

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

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

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

TEST SECTION NUMBER OF NEAREST GPS SECTION 483835

SUPPLEMENTAL TEST SECTIONS

IF SUPPLEMENTAL EXPERIMENTAL TEST SECTIONS ARE PROPOSED. COMPLETE THE FOLLOWING

TOTAL NUMBER OF SUPPLEMENTAL TEST SECTIONS

FACTORS TO BE INVESTIGATED

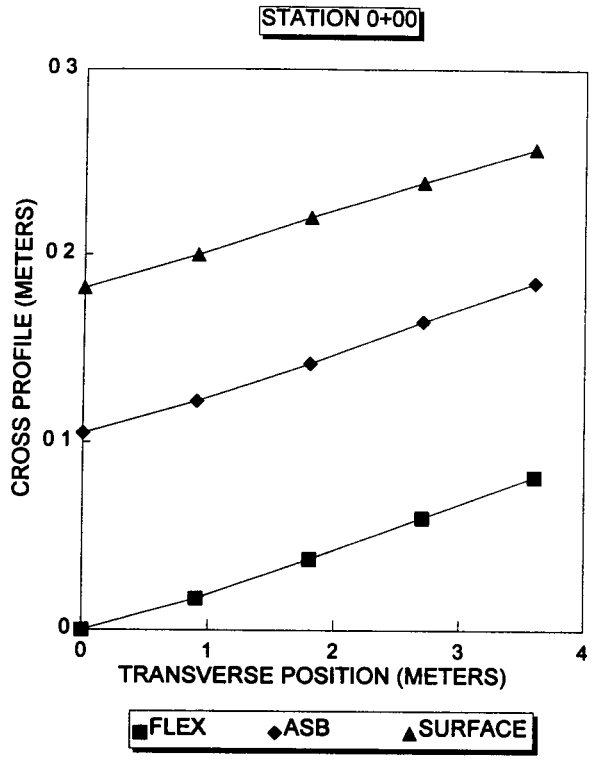
APPENDIX B

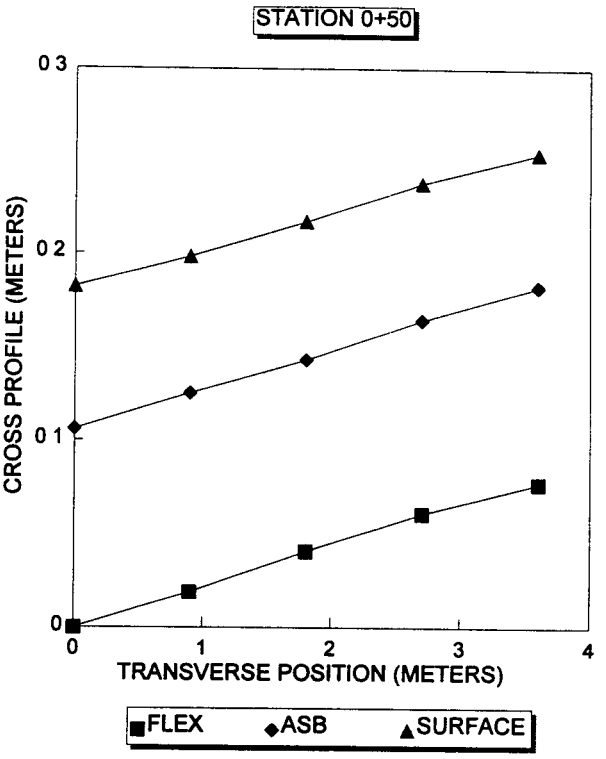
SURFACE PROFILE DATA

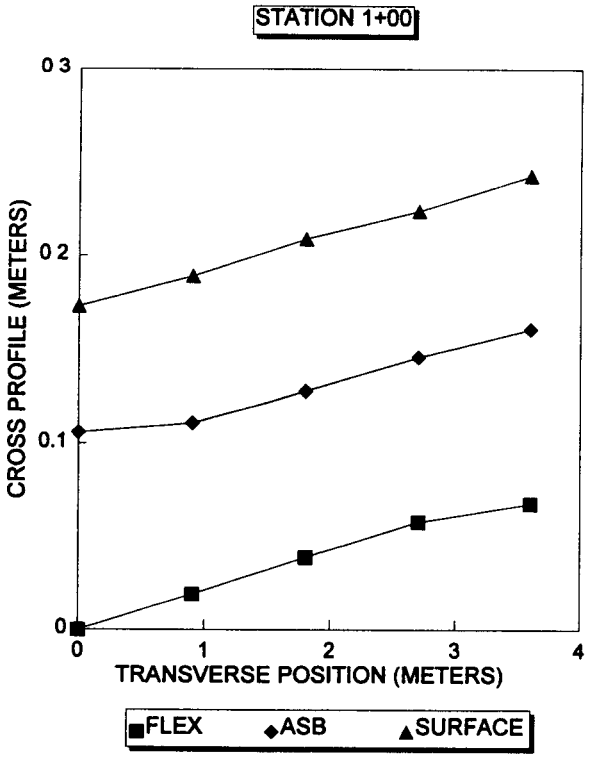
SECTION 480802 TEXAS

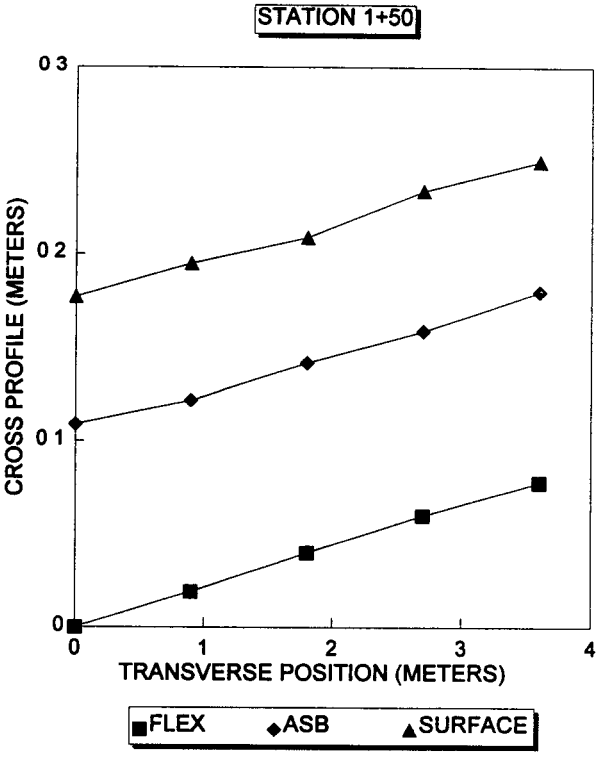
Trans. Offset	LAYER	0.0M Flex. Base Thickness (M)	(in)	Surface Thickness (M)	(in)	0.84M Flex. Base Thickness (M)	(in)	Surface Thickness (M)	(in)	1.68M Flex. Base Thickness (M)	(in)	Surface Thickness (M)	(in)	2.52M Flex. Base Thickness (M)	(in)	Surface Thickness (M)	(in)	3.35M Flex. Base Thickness (M)	(in)	Surface Thickness (M)	(in)
0+00 (117+00)	FLEX BLACK SURFACE	0.287	11.280	0.198	7.800	0.283	11.160	0.195	7.680	0.274	10.800	0.198	7.800	0.259	10.200	0.207	8.160	0.250	9.840	0.216	8.520
0+50	FLEX BLACK SURFACE	0.247	9.720	0.204	8.040	0.241	9.480	0.210	8.280	0.244	9.600	0.213	8.400	0.238	9.360	0.226	8.880	0.241	9.480	0.235	9.240
1+00	FLEX BLACK SURFACE	0.265	10.440	0.204	8.040	0.271	10.680	0.201	7.920	0.290	11.400	0.192	7.560	0.293	11.520	0.189	7.440	0.287	11.280	0.210	8.280
1+50	FLEX BLACK SURFACE	0.256	10.080	0.201	7.920	0.265	10.440	0.195	7.680	0.271	10.680	0.195	7.680	0.287	11.280	0.189	7.440	0.280	11.040	0.210	8.280
2+00	FLEX BLACK SURFACE	0.244	9.600	0.213	8.400	0.241	9.480	0.213	8.400	0.262	10.320	0.201	7.920	0.271	10.680	0.195	7.680	0.268	10.560	0.207	8.160
2+50	FLEX BLACK SURFACE	0.268	10.560	0.216	8.520	0.262	10.320	0.216	8.520	0.253	9.960	0.219	8.640	0.247	9.720	0.226	8.880	0.238	9.360	0.235	9.240
3+00	FLEX BLACK SURFACE	0.296	11.640	0.201	7.920	0.302	11.880	0.192	7.560	0.293	11.520	0.192	7.560	0.290	11.400	0.195	7.680	0.277	10.920	0.213	8.400
3+50	FLEX BLACK SURFACE	0.262	10.320	0.195	7.680	0.259	10.200	0.195	7.680	0.250	9.840	0.201	7.920	0.250	9.840	0.207	8.160	0.250	9.840	0.219	8.640
4+00	FLEX BLACK SURFACE	0.271	10.680	0.195	7.680	0.274	10.800	0.192	7.560	0.293	11.520	0.183	7.200	0.296	11.640	0.186	7.320	0.290	11.400	0.201	7.920
4+50	FLEX BLACK SURFACE	0.274	10.800	0.192	7.560	0.287	11.280	0.186	7.320	0.290	11.400	0.186	7.320	0.293	11.520	0.186	7.320	0.317	12.480	0.168	6.600
5+00 (122+00)	FLEX BLACK SURFACE	0.296	11.640	0.168	6.600	0.296	11.640	0.168	6.600	0.296	11.640	0.171	6.720	0.290	11.400	0.180	7.080	0.277	10.920	0.201	7.920
	AVG	0.270	10.615	0.199	7.833	0.271	10.669	0.197	7.745	0.274	10.789	0.196	7.702	0.274	10.778	0.199	7.822	0.270	10.647	0.211	8.291
	MIN	0.244	9.600	0.168	6.600	0.241	9.480	0.168	6.600	0.244	9.600	0.171	6.720	0.238	9.360	0.180	7.080	0.238	9.360	0.168	6.600
	MAX	0.296	11.640	0.216	8.520	0.302	11.880	0.216	8.520	0.296	11.640	0.219	8.640	0.296	11.640	0.226	8.880	0.317	12.480	0.235	9.240
	STD DEV	0.017	0.662	0.012	0.480	0.019	0.755	0.013	0.515	0.018	0.724	0.013	0.511	0.021	0.810	0.015	0.592	0.023	0.902	0.017	0.684

SECTION 480802

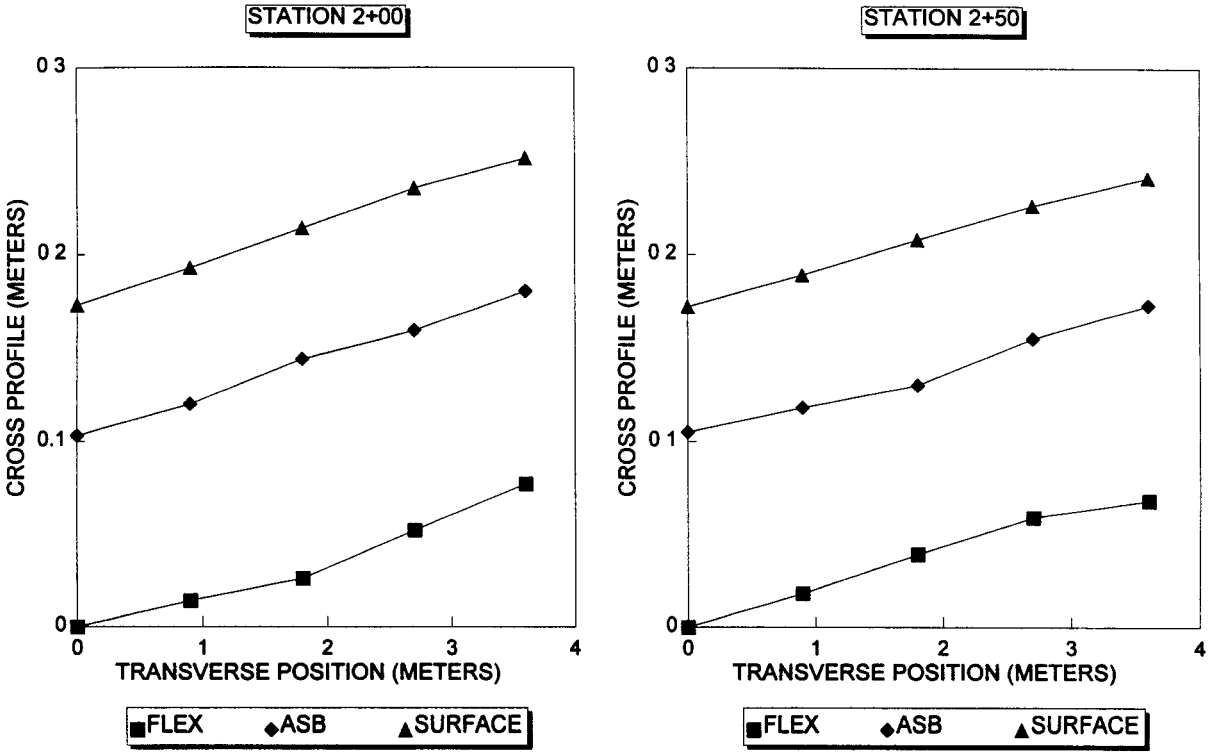


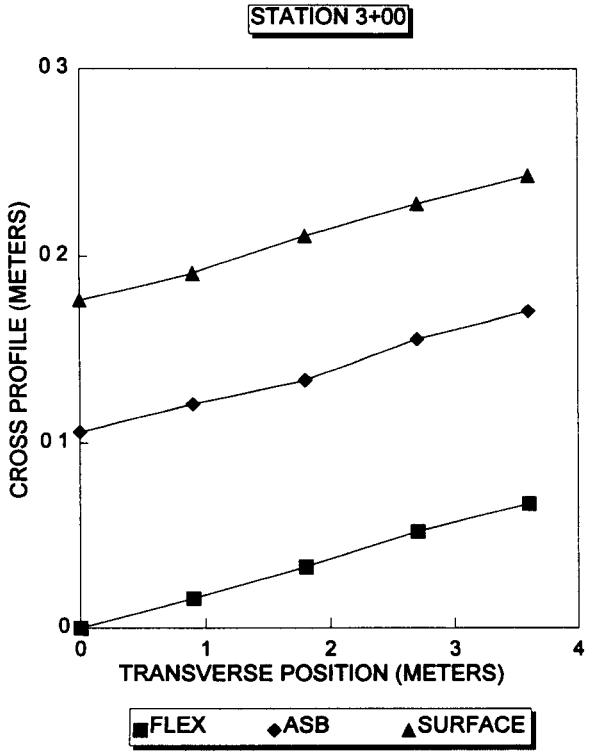


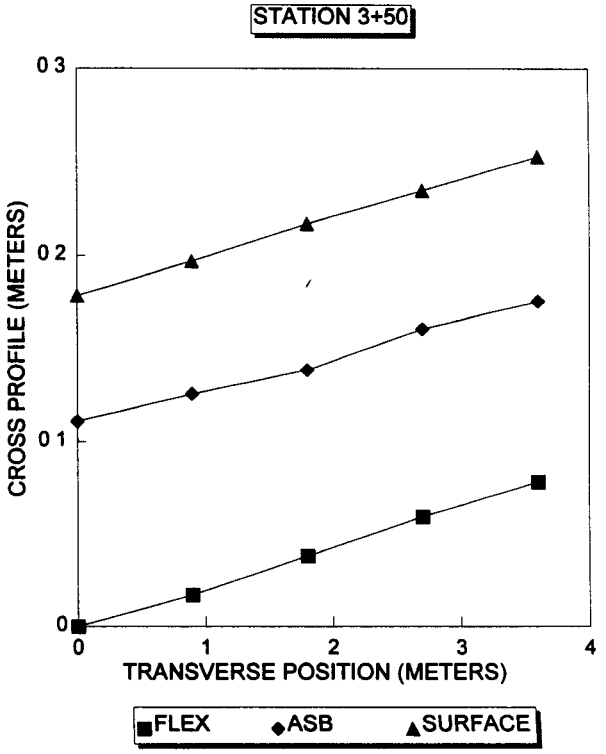




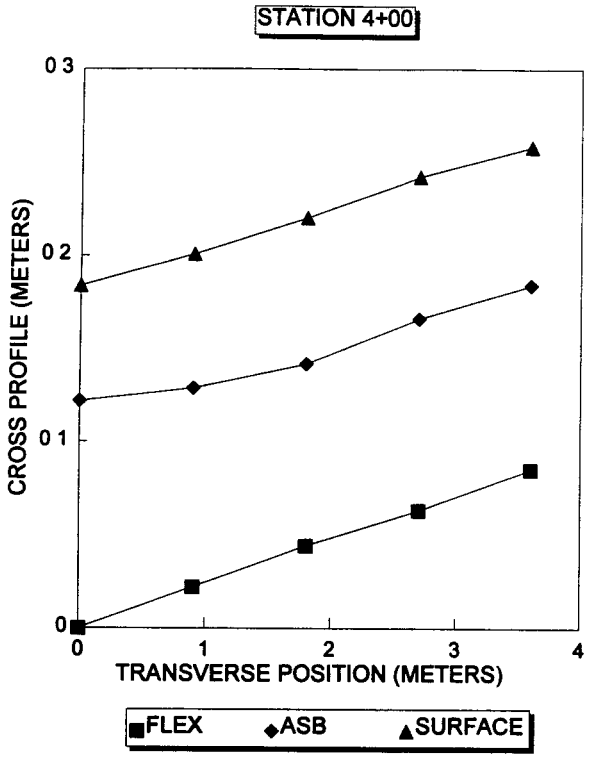
SECTION 480802

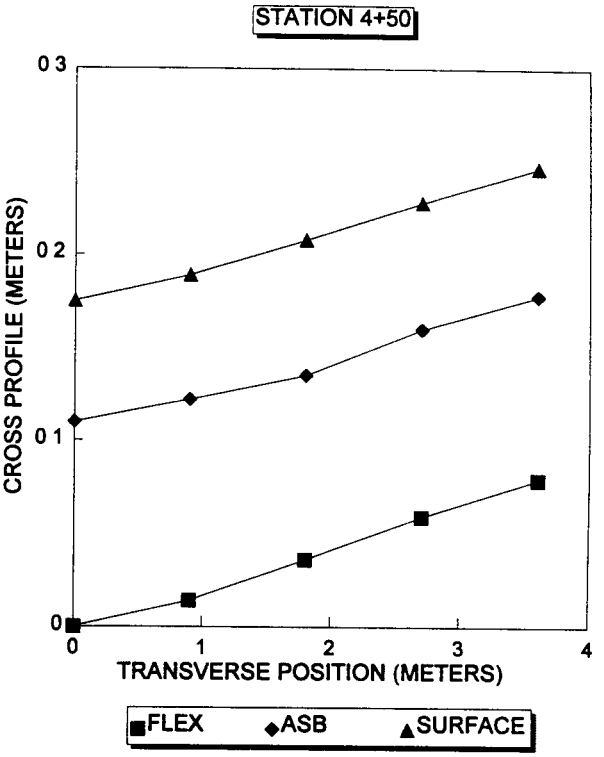


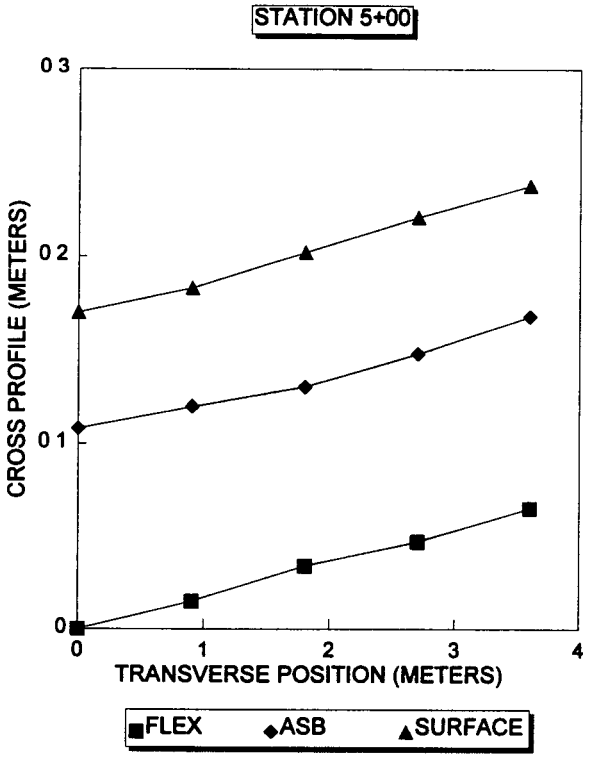




SECTION 480802



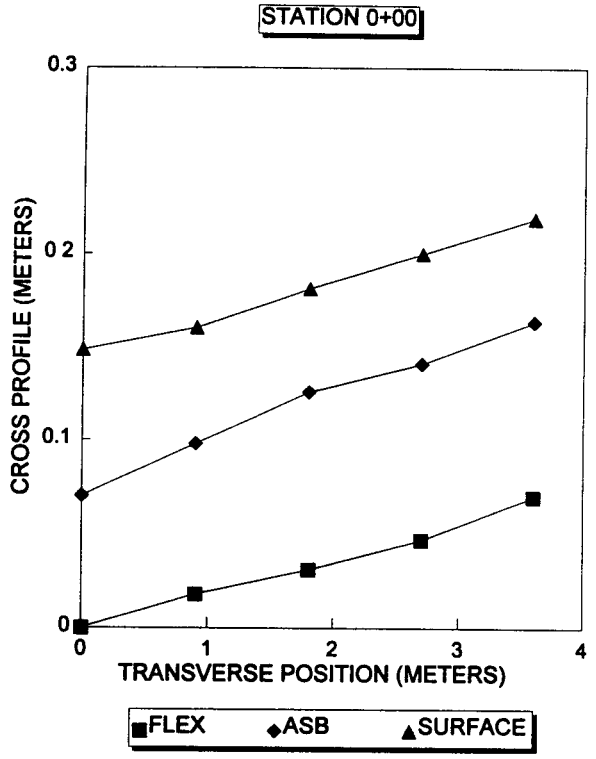


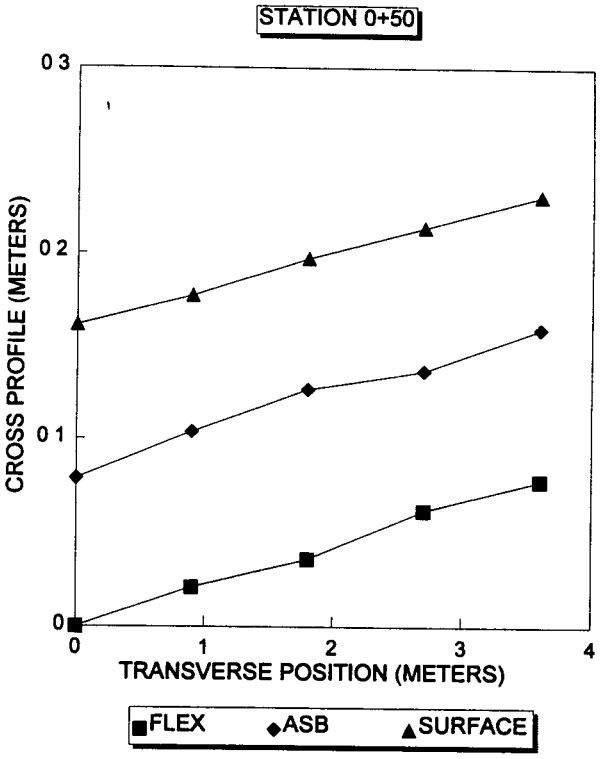


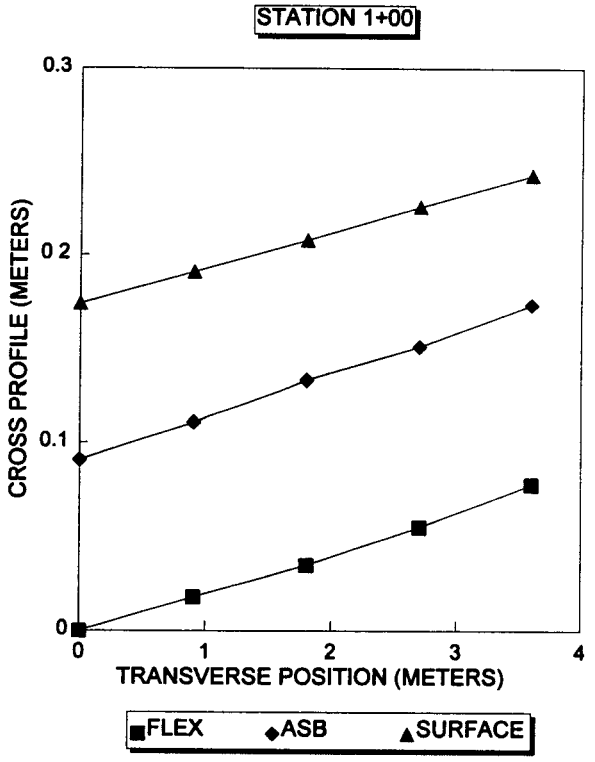
SECTION 480801 TEXAS

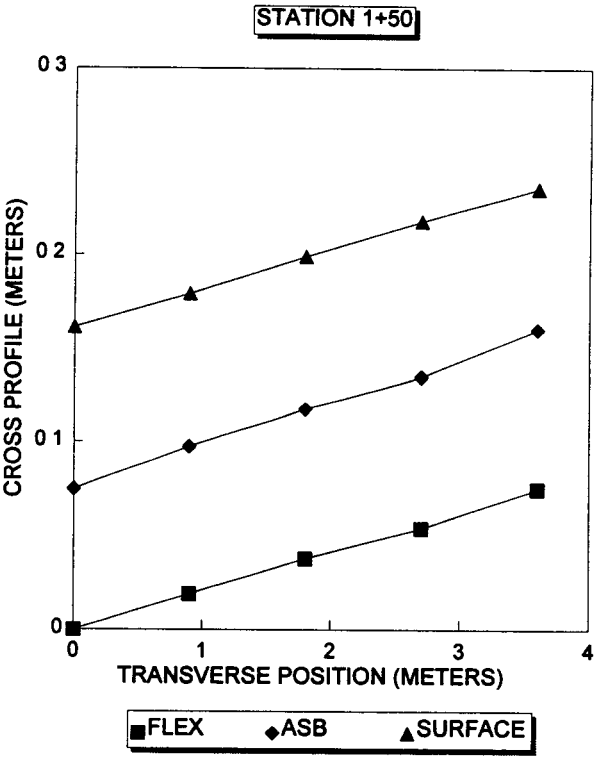
Trans. Offset	LAYER	0.0M Flex. Base Thickness (M)	(in)	Surface Thickness (M)	(in)	0.84M Flex. Base Thickness (M)	(in)	Surface Thickness (M)	(in)	1.68M Flex. Base Thickness (M)	(in)	Surface Thickness (M)	(in)	2.52M Flex. Base Thickness (M)	(in)	Surface Thickness (M)	(in)	3.35M Flex. Base Thickness (M)	(in)	Surface Thickness (M)	(in)
0+00 (124+00)	FLEX BLACK SURFACE	0.204	8.040	0.116	4.560	0.204	8.040	0.116	4.560	0.201	7.920	0.119	4.680	0.186	7.320	0.131	5.160	0.186	7.320	0.140	5.520
0+50	FLEX BLACK SURFACE	0.226	8.880	0.116	4.560	0.235	9.240	0.113	4.440	0.229	9.000	0.116	4.560	0.226	8.880	0.122	4.800	0.219	8.640	0.137	5.400
1+00	FLEX BLACK SURFACE	0.213	8.400	0.125	4.920	0.223	8.760	0.119	4.680	0.219	8.640	0.119	4.680	0.213	8.400	0.125	4.920	0.204	8.040	0.137	5.400
1+50	FLEX BLACK SURFACE	0.183	7.200	0.131	5.160	0.189	7.440	0.128	5.040	0.195	7.680	0.128	5.040	0.195	7.680	0.128	5.040	0.192	7.560	0.140	5.520
2+00	FLEX BLACK SURFACE	0.223	8.760	0.131	5.160	0.226	8.880	0.122	4.800	0.229	9.000	0.116	4.560	0.229	9.000	0.113	4.440	0.216	8.520	0.134	5.280
2+50	FLEX BLACK SURFACE	0.244	9.600	0.137	5.400	0.250	9.840	0.125	4.920	0.256	10.080	0.122	4.800	0.247	9.720	0.128	5.040	0.241	9.480	0.140	5.520
3+00	FLEX BLACK SURFACE	0.226	8.880	0.125	4.920	0.226	8.880	0.119	4.680	0.219	8.640	0.122	4.800	0.210	8.280	0.125	4.920	0.198	7.800	0.140	5.520
3+50	FLEX BLACK SURFACE	0.226	8.880	0.101	3.960	0.226	8.880	0.091	3.600	0.210	8.280	0.104	4.080	0.198	7.800	0.116	4.560	0.189	7.440	0.131	5.160
4+00	FLEX BLACK SURFACE	0.241	9.480	0.107	4.200	0.241	9.480	0.104	4.080	0.241	9.480	0.104	4.080	0.226	8.880	0.113	4.440	0.213	8.400	0.128	5.040
4+50	FLEX BLACK SURFACE	0.250	9.840	0.122	4.800	0.250	9.840	0.113	4.440	0.235	9.240	0.128	5.040	0.219	8.640	0.137	5.400	0.216	8.520	0.140	5.520
5+00 (129+00)	FLEX BLACK SURFACE	0.207	8.160	0.134	5.280	0.201	7.920	0.131	5.160	0.195	7.680	0.134	5.280	0.186	7.320	0.140	5.520	0.180	7.080	0.152	6.000
	AVG	0.222	8.738	0.122	4.811	0.224	8.836	0.116	4.582	0.221	8.695	0.119	4.691	0.212	8.356	0.125	4.931	0.205	8.073	0.138	5.444
	MIN	0.183	7.200	0.101	3.960	0.189	7.440	0.091	3.600	0.195	7.680	0.104	4.080	0.186	7.320	0.113	4.440	0.180	7.080	0.128	5.040
	MAX	0.250	9.840	0.137	5.400	0.250	9.840	0.131	5.160	0.256	10.080	0.134	5.280	0.247	9.720	0.140	5.520	0.241	9.480	0.152	6.000
	STD DEV	0.019	0.731	0.011	0.433	0.019	0.740	0.011	0.424	0.019	0.730	0.009	0.356	0.018	0.728	0.009	0.341	0.017	0.681	0.006	0.236

SECTION 480801

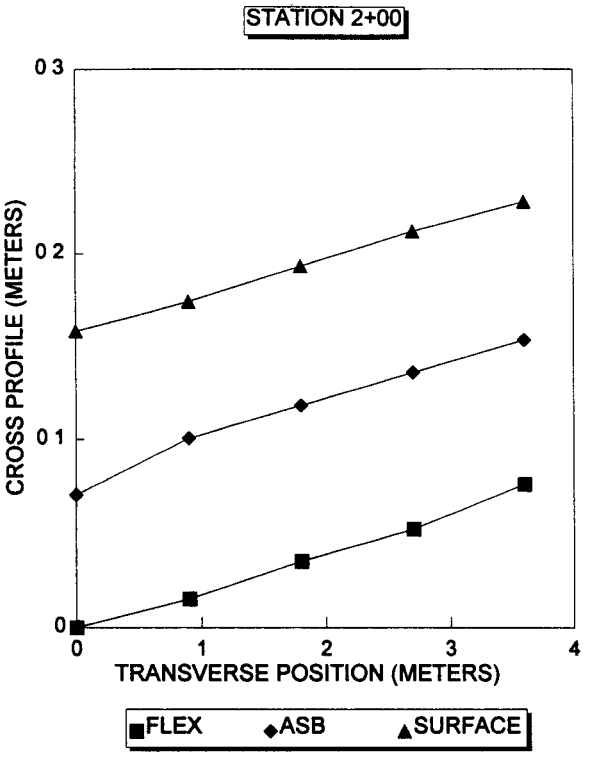


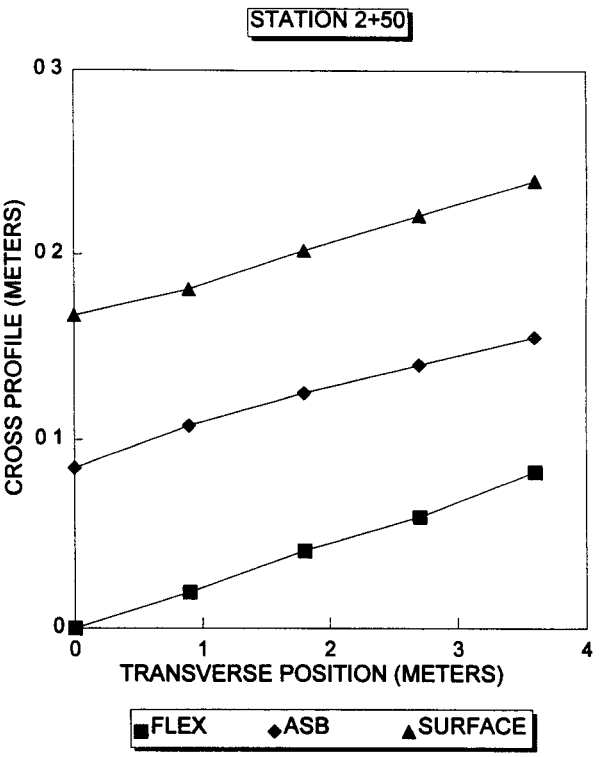


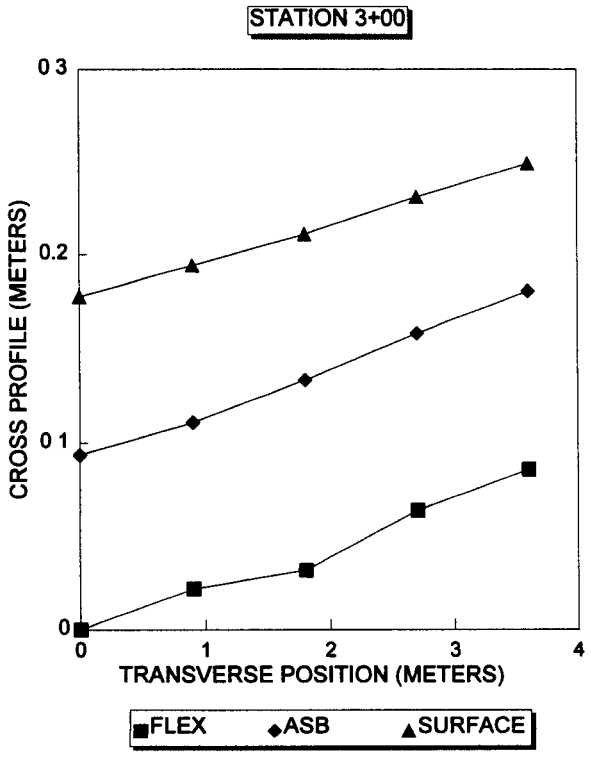


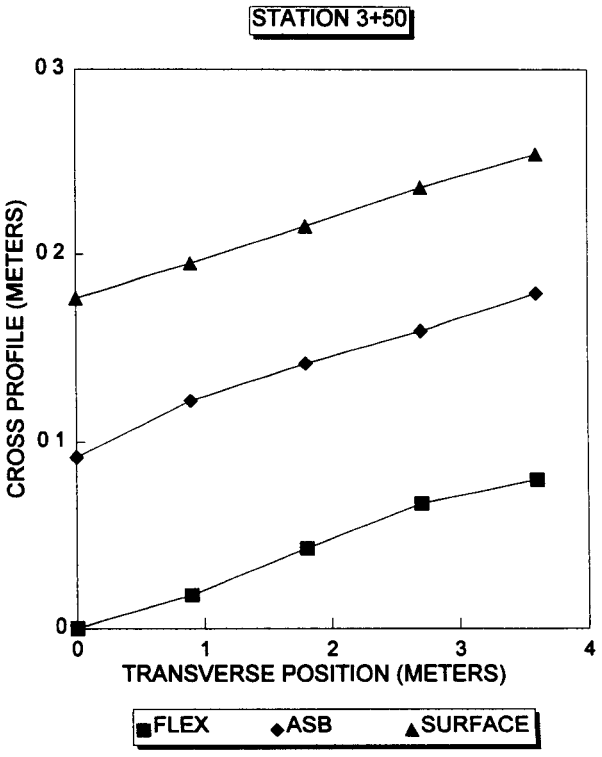


SECTION 480801

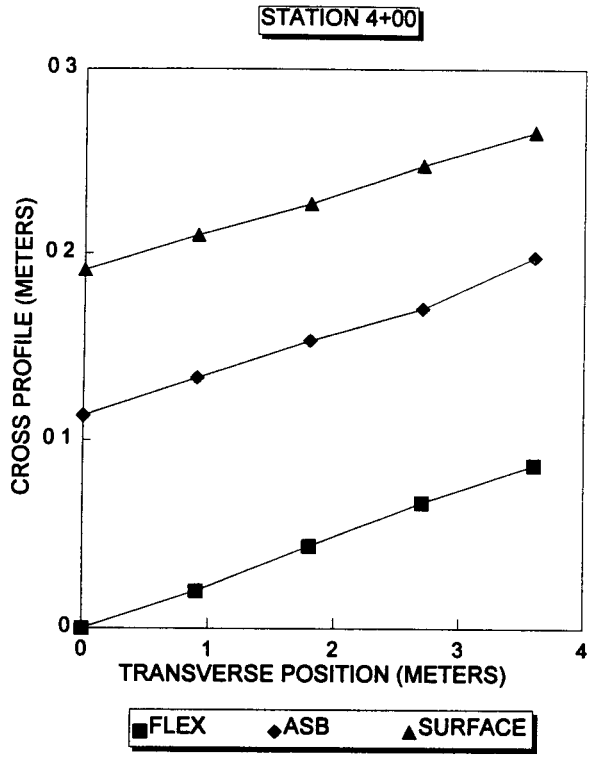


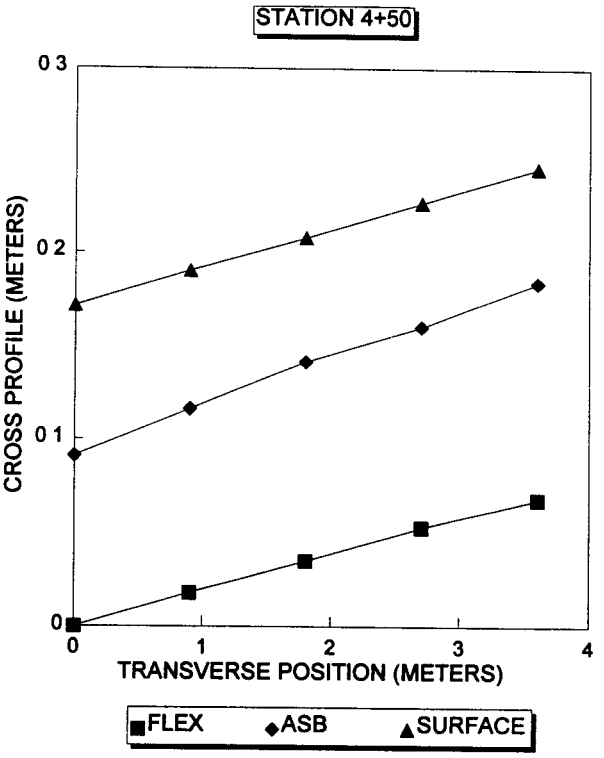


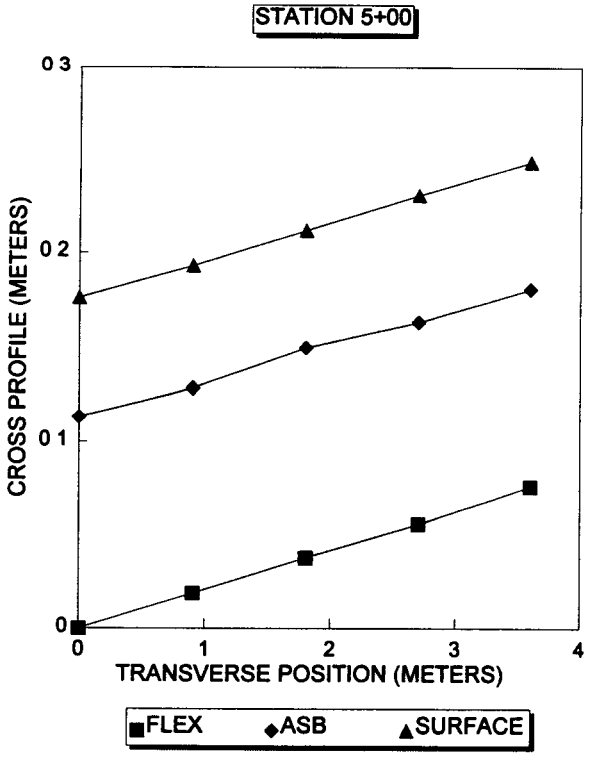




SECTION 480801







APPENDIX C

MATERIALS SAMPLING AND TESTING PLAN

MATERIAL SAMPLING
AND
TESTING PLAN

TEXAS SPS-8 PROJECT 480800
FM-2223 EBL, BRAZOS COUNTY, TEXAS

PREPARED BY:

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

REVISED AUGUST 1995

MATERIAL SAMPLING AND TESTING PLAN
TEXAS SPS-8 PROJECT (480800)
FM-2223 EBL, BRAZOS COUNTY, TEXAS

INTRODUCTION

As part of their participation in the FHWA/LTPP studies, the State of Texas has elected to construct an SPS-8 project to study the environmental effects in the absence of heavy loads. This project will consist of two test sections with similar details and materials on FM 2223, in the eastbound lane, in Brazos County, Texas. 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. Texas's involvement in the study will provide critical information in the wet-no freeze environmental zone, on an active 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 Texas Department of Transportation, 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 117+00 to the end of the last section at Station 129+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 Texas DOT 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

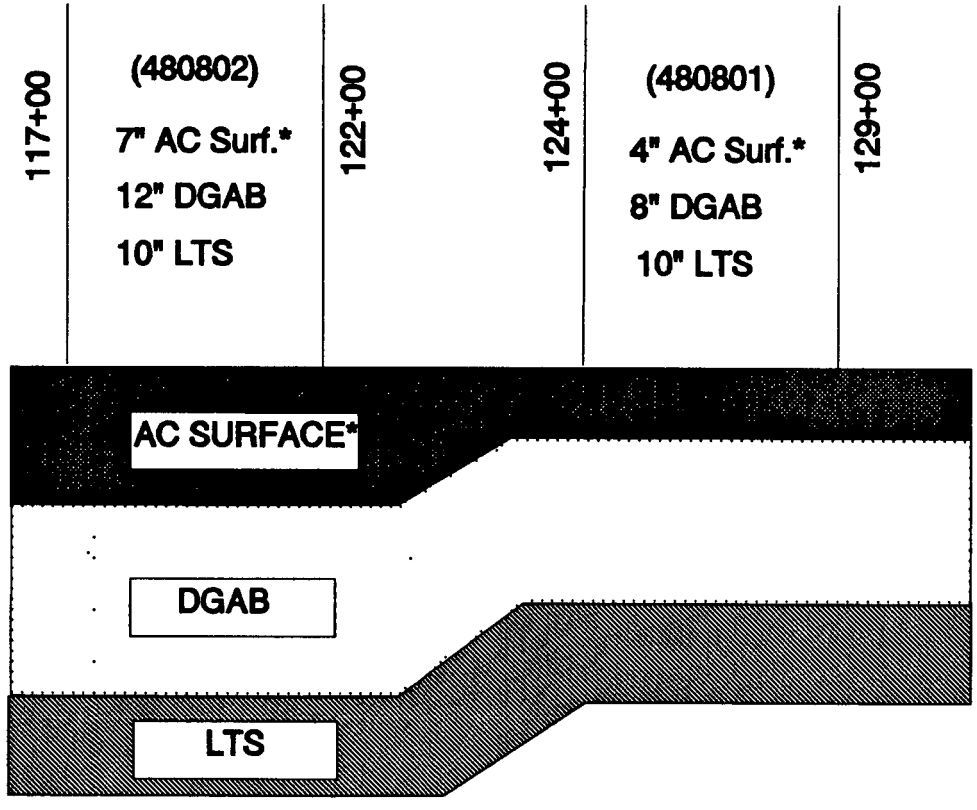
Section (Cell ID)	Cross Section	Begin Station	End Station
480801	2″ AC Surface	124+00	129+00
	2″ AC Binder		
	8″ DGAB		
	10″ LTS		
480802	2″ AC Surface	117+00	122+00
	5″ AC Binder		
	12″ DGAB		
	10″ LTS		

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

Begin Sta.	End Sta.	Section ID	Thickness (In.)	
			AC Surface*	DGAB
117+00	122+00	480802	7	12
122+00	124+00	Transition	4-7	8-12
124+00	129+00	480801	4	8

* Combined Binder and Wearing Course Thickness

FIGURE A-1. LAYOUT OF TEST SECTIONS
TEXAS SPS-8 (480800)



* Combined Binder and Wearing Course Thickness

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-8 show the locations and numbering scheme for the many samples and tests scheduled. Figures B-2 through B-6 show the sampling and testing to occur for each stage of the paving, while Figures B-7 and B-8 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	BV4,BV5,BV6-From Plant
Bulk Sampling - Binder 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	B7-B9
Moisture Content Samples	3	B7-B9
Lime-Treated Subgrade (LTS)		
Bulk Sampling (400 lb/sample)	3	B4-B6
Moisture Content Samples	3	B4-B6
Permeability	1	B5
Expansion Index	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 - Surface In Situ Density (Nuclear Gauge)	10	T25-T30, SA1-SA4
Asphalt Concrete In Situ Density (Nuclear Gauge)	10	T19-T24, SA1-SA4
Dense-Graded Aggregate Base In Situ Density, Moisture Content (Nuclear Gauge)	6	T13-T18
Lime-Treated Subgrade (LTS) In Situ Density, Moisture Content (Nuclear Gauge)	9	T7-T12, B4-B6
Subgrade In Situ Density, Moisture Content (Nuclear Gauge) Shoulder Auger Probe	9 2	T1-T6, B1-B3 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 - Surface Gradation (55 Gallon Drum)	1	From Plant
Aggregate - Binder Gradation (55 Gallon Drum)	1	From Plant
Finished Asphaltic Concrete Mix - Surface (5 Gallon Containers)	3	From Paver
Finished Asphaltic Concrete Mix - Binder (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
TEXAS SPS-8 (480800)

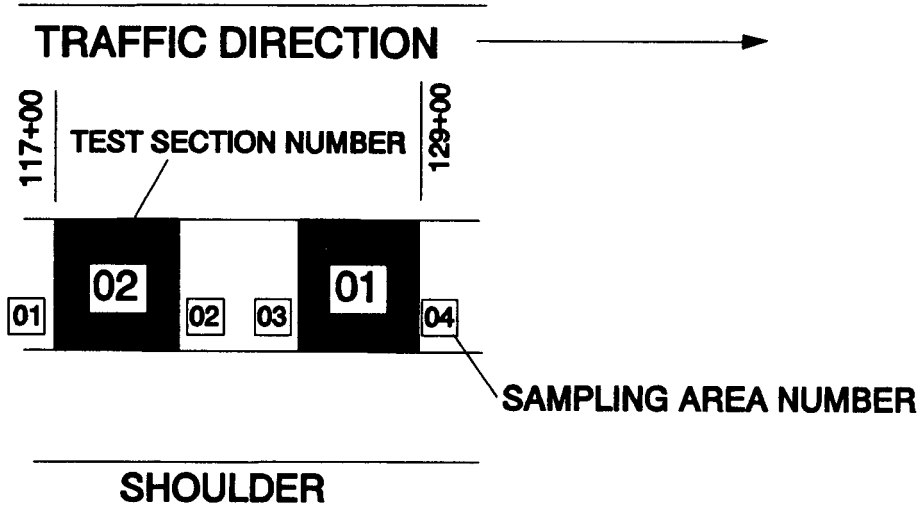
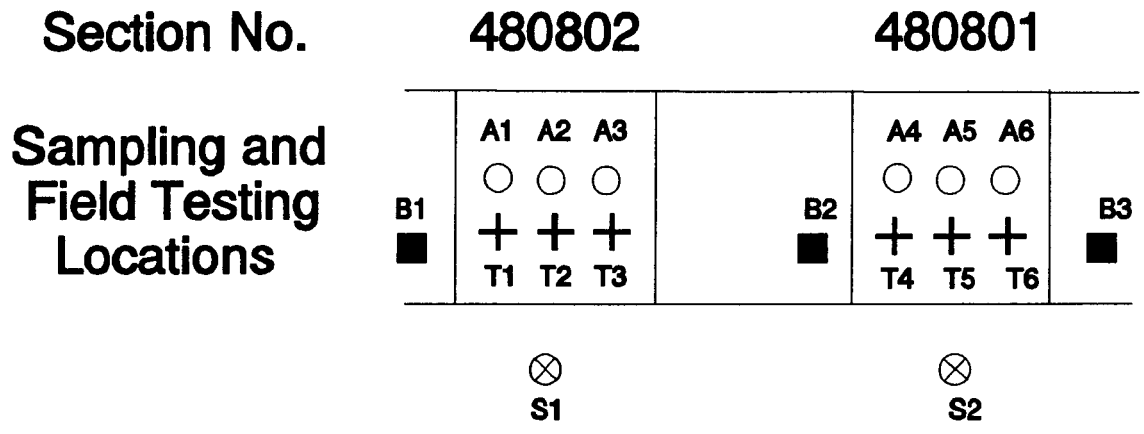


FIGURE B-2. SAMPLING AND TESTING LOCATIONS FOR SUBGRADE
TEXAS SPS-8 (480800)



LEGEND

■ 2 X 2 bulk sampling location (B1 - B3)

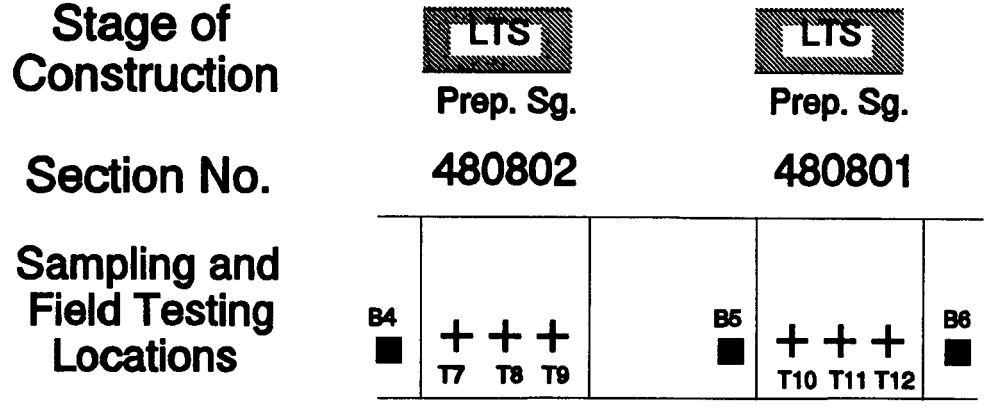
○ Shelby tube/splitspoon sampling to 4' below top of subgrade (A1 - A6).

⊗ Shoulder probe (S1 - S2)

\+ Location of in situ density testing (T1 - T6)

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

FIGURE B-3. SAMPLING AND TESTING LOCATIONS FOR LTS TEXAS SPS-8 (480800)



LEGEND

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

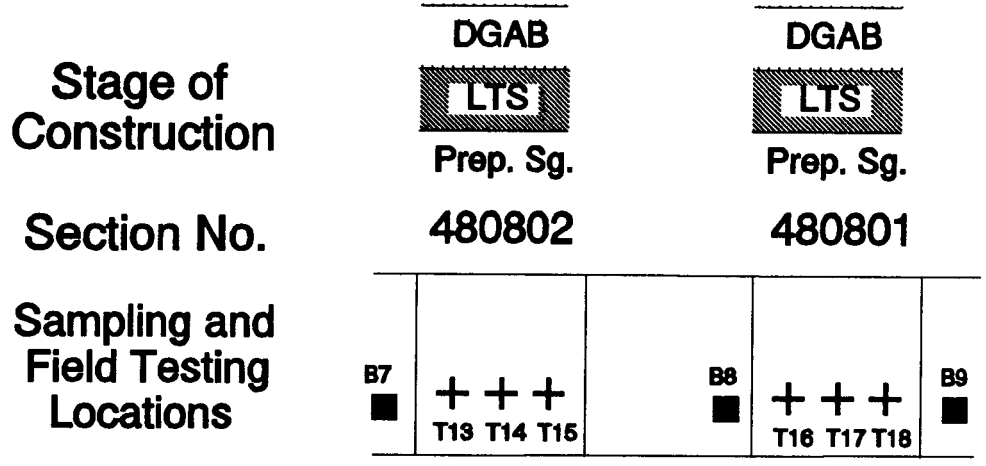
■ Location of bulk sampling of LTS (B4 - B6)

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

Prep. Sg. - Prepared Subgrade

LTS - Lime Treated Subgrade

FIGURE B-4. SAMPLING AND TESTING LOCATIONS FOR DGAB
TEXAS SPS-8 (480800)



LEGEND

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

■ Location of bulk sampling of DGAB (B7 - B9)

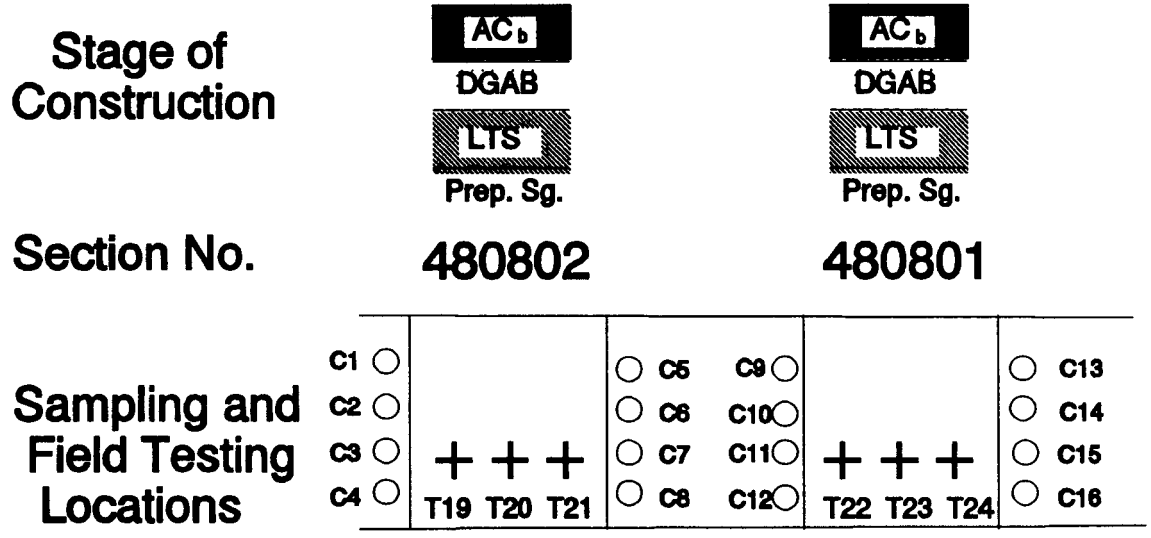
Note: Nuclear density/moisture testing must be conducted at bulk sampling locations prior to excavation.

Prep. Sg. - Prepared Subgrade

LTS - Lime Treated Subgrade

DGAB - Dense Graded Aggregate Base

FIGURE B-5. SAMPLING AND TESTING LOCATIONS FOR AC BINDER
TEXAS SPS-8 (480800)



LEGEND

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

+ Location of in situ density testing (T19 - T24)

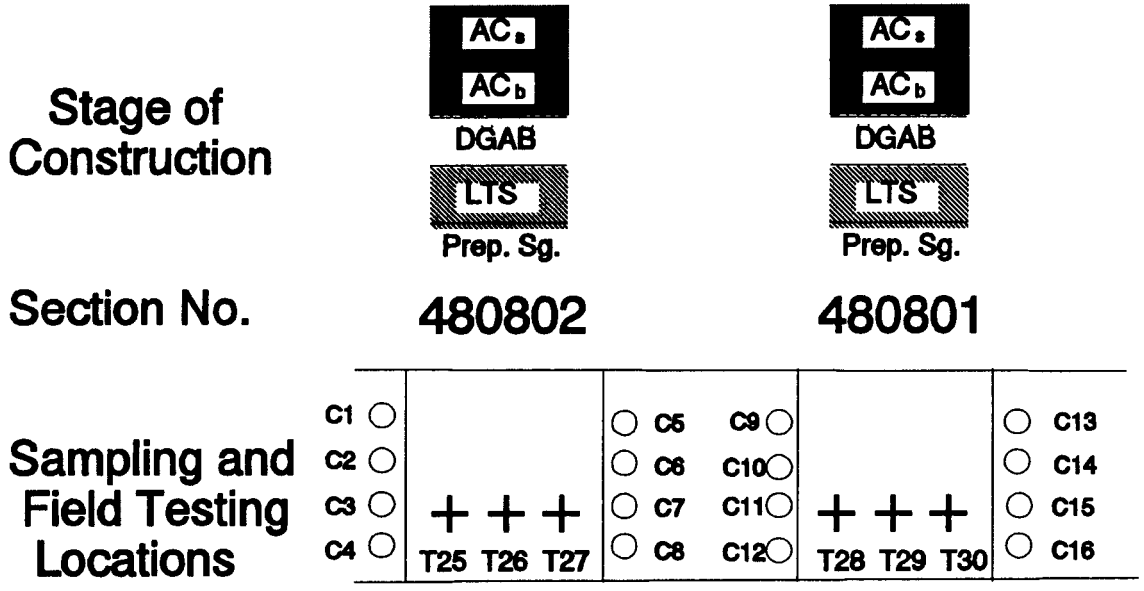
Prep. Sg. - Prepared Subgrade

LTS - Lime Treated Subgrade

DGAB - Dense Graded Aggregate Base

AC$_b$ - Asphalt Concrete Binder

FIGURE B-6. SAMPLING AND TESTING LOCATIONS FOR AC SURFACE TEXAS SPS-8 (480800)



LEGEND

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

+ Location of in situ density testing (T25 - T30)

Prep. Sg. - Prepared Subgrade

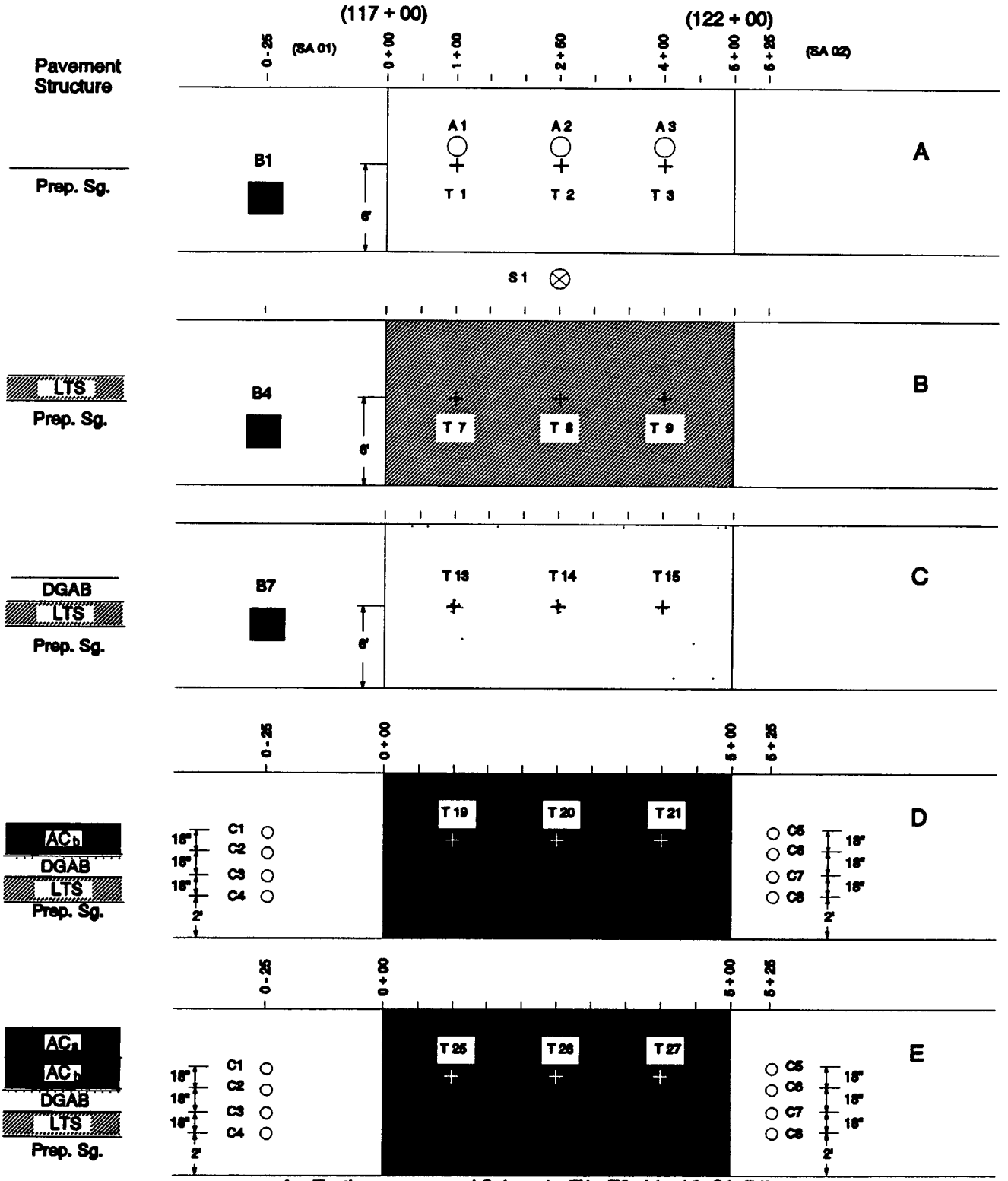
LTS - Lime Treated Subgrade

DGAB - Dense Graded Aggregate Base

AC_b - Asphalt Concrete Binder

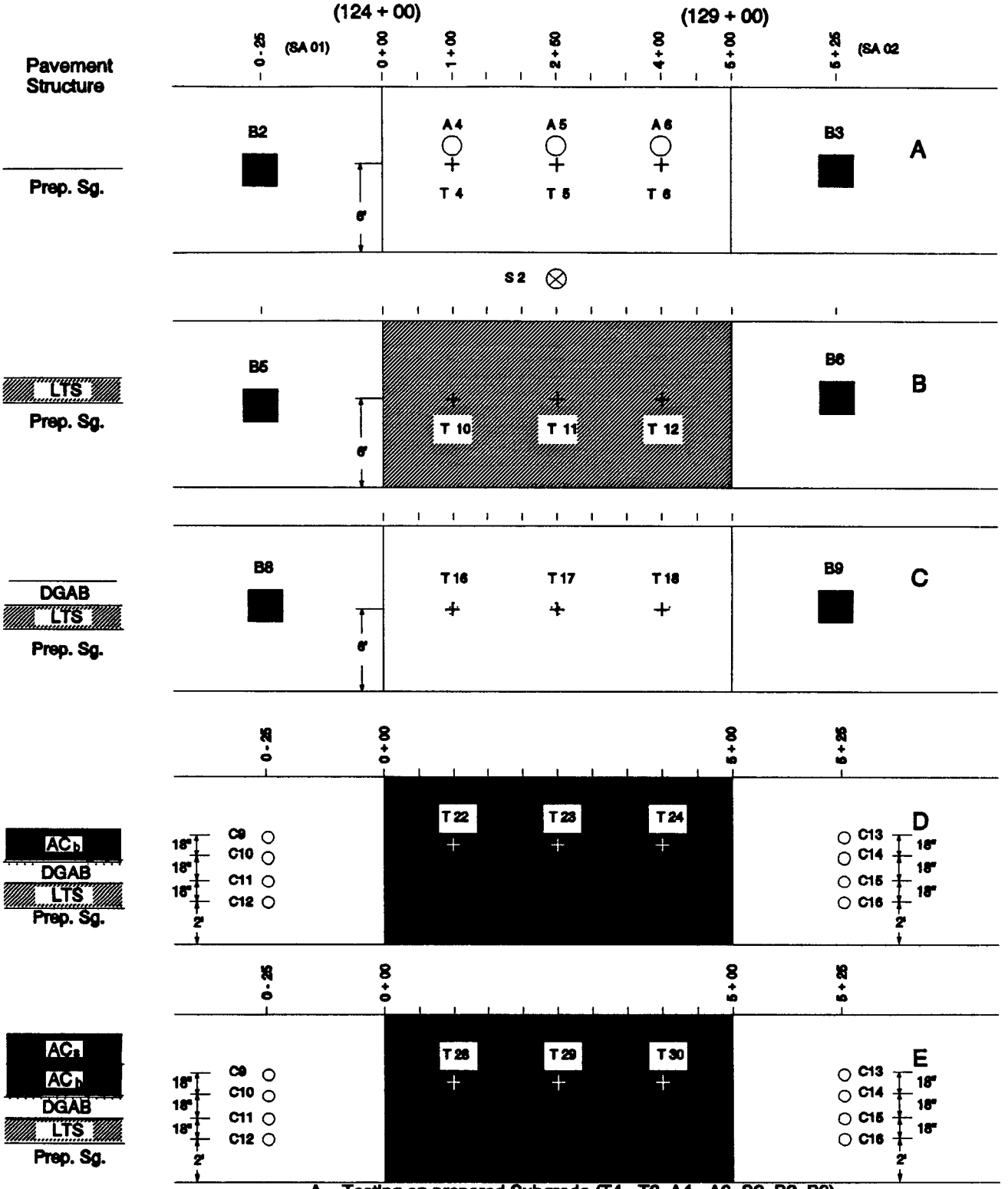
AC_s - Asphalt Concrete Surface

FIGURE B-7. SAMPLING AND TESTING PLAN FOR TEST SECTION 480802



A Testing on prepared Subgrade (T1 - T3, A1 - A3, S1, B1)
B Testing on Lime Treated Subgrade (T7 - T9, B4)
C Testing on compacted DGAB (T13 - T15, B7)
D Testing on AC binder (T19 - T21, C1 - C8)
E Testing on finished AC Surface (T25 - T27)
Coring AC Surface (C1 - C8)

FIGURE B-8. SAMPLING AND TESTING PLAN FOR TEST SECTION 480801



A Testing on prepared Subgrade (T4 - T6, A4 - A6, S2, B2, B3)
B Testing on Lime Treated Subgrade (T10 - T12, B5, B6)
C Testing on compacted DGAB (T16 - T18, B8, B9)
D Testing on AC binder (T22 - T24, C9 - C16)
E Testing on finished AC Surface (T28 - T30)
Coring AC Surface (C9 - C16)

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 Surface			
BV4	BA04	3	91 kg (200 lb) bulk sample
BV5	BA05	3	91 kg (200 lb) bulk sample
BV6	BA06	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
Asphalt Concrete Binder			
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
Dense-Graded Aggregate Base			
B7	BG04	2	45 kg (100 lb) bulk sample
B8	BG05	2	45 kg (100 lb) bulk sample
B9	BG06	2	45 kg (100 lb) bulk sample
Lime-Treated Subgrade			
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	1	102 mm (4 in.) Core
C6	CA06	1	102 mm (4 in.) Core
C7	CA07	1	102 mm (4 in.) Core
C8	CA08	1	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	1	102 mm (4 in.) Core
C14	CA14	1	102 mm (4 in.) Core
C15	CA15	1	102 mm (4 in.) Core
C16	CA16	1	102 mm (4 in.) Core
Dense-Graded Aggregate Base			
B7	BG04	2	136 kg (300 lb) Bulk Sample
B8	BG05	2	136 kg (300 lb) Bulk Sample
B9	BG06	2	136 kg (300 lb) Bulk Sample
B7	MG04	2	Moisture Content Jar Sample
B8	MG05	2	Moisture Content Jar Sample
B9	MG06	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
Lime-Treated Subgrade			
B4	BG01	2	136 kg (300 lb) Bulk Sample
B5	BG02	2	136 kg (300 lb) Bulk Sample
B6	BG03	2	136 kg (300 lb) Bulk Sample
B4	MG01	2	Moisture Content Jar Sample
B5	MG02	2	Moisture Content Jar Sample
B6	MG03	2	Moisture Content Jar Sample
Subgrade			
B1	BS01	2	136 kg (300 lb) Bulk Sample
B2	BS02	2	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	2	Moisture Content Jar Sample
B2	MS02	2	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 Texas 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-6 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-7 through C-10 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	Lime-Treated Subgrade	Lime Treatment for Materials in Place (Item 260)
3	Dense Graded Aggregate Base (DGAB)	Flexible Base (Item 247) Type A, Grade 2
4	Hot Mix Asphalt Concrete Surface Course	Hot Mix Asphaltic Concrete Pavement (Item 340) Type B
5	Hot Mix Asphalt Concrete Surface Course	Hot Mix Asphaltic Concrete Pavement (Item 340) Type D

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	A1-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	2	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		?
DENSE GRADED AGGREGATE BASE						
Particle Size Analysis	UG01	P41	3	B4-B6 37-89		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 37-89		X
In-Place Density		SHRP-LTPP Method	6	T13-T18	X	

ALS
6/11/96

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
LIME-TREATED SUBGRADE						
Sieve Analysis	SS01	P51	3	B4-B6		X
Hydrometer to 0.001 mm	SS02	P42	3	B4-B6		X
Atterberg Limits	SS03	P43	3	B4-B6		X
Moisture-Density Relations	SS05	P55	3	B4-B6		X
Resilient Modulus	SS07	P46	3	B4-B6		X
Natural Moisture Content	SS09	P49	3	B4-B6		X
Permeability	SS11	P57	3	B4-B6	X	
Expansion Index	SS12	P60	3	B4-B6		?
In-Place Density		SHRP-LTPP Method	9	B4-B6, T7-T12	X	
ASPHALTIC CONCRETE 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	T19-T24	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	
Gradation of Aggregate	AG04	P14A	3	BV1-BV3 From Paver	X	
NAA Test for Fine Aggregate	AG05	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	

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						
Core Examination/Thickness	AC01	P01	16	All Cores		X
Bulk Specific Gravity	AC02	P02	16	All Cores		X
Maximum Specific Gravity	AC03	P03	3	BV4-BV6 From Paver	X	
Asphalt Content (Extraction)	AC04	P04	3	BV4-BV6 From Paver	X	
Moisture Susceptibility	AC05	P05	3	BV4-BV6 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	T25-T30	X	
Extracted Aggregate:						
Specific Gravity:						
Coarse Aggregate	AG01	P11	3	BV4-BV6 From Paver	X	
Fine Aggregate	AG02	P12	3	BV4-BV6 From Paver	X	
Gradation of Aggregate	AG04	P14	3	BV4-BV6 From Paver	X	
NAA Test for Fine Aggregate	AG05	P14A	3	BV4-BV6 From Paver	X	
Asphalt Cement (Abson Recovery):						
Abson Recovery	AE01	P21	3	BV4-BV6 From Paver	X	
Penetration at 4°C, 25°C, 32°C (50°F, 77°F, 90°F)	AE02	P22	3	BV4-BV6 From Paver	X	
Specific Gravity 16°C (60°F)	AE03	P23	3	BV4-BV6 From Paver	X	
Viscosity at 25°C (77°F)	AE04	P24	3	BV4-BV6 From Paver	X	
Viscosity at 60°C, 135°C (140°F, 275°F)	AE05	P25	3	BV4-BV6 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 Paver		
Specific Gravity 16°C (60°F)	AE03	P23	3	BC1-BC3 From Paver		
Viscosity at 25°C (77°F)	AE04	P24	3	BC1-BC3 From Paver		
Viscosity at 60°C, 135°C (140°F, 275°F)	AE05	P25	3	BC1-BC3 From Paver		

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

Sample Location	Sample Number	Lab Test Number (1)	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample (2)	Sample Storage (3)	Sample Disposed? (4)
			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
BV4	BA04	3	See Figure C.1				No	(a)	Yes
BV5	BA05	3	See Figure C.1				No	(a)	Yes
BV6	BA06	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.

(1) Lab Test Number - Shall be assigned as per the following:
   a. Beginning of the Section (Station 0-): Samples of each layer that are retrieved from areas in the approach end of the test section (stations preceding 0+00) shall be assigned Laboratory Test Number '1'.
   b. End of Section (Stations 5+): Samples of each layer that are retrieved from areas in the leave end of the test section (stations after 5+00) shall be assigned Laboratory Test Number '2'.
   c. Middle of the Section (Stations 0+00 to 5+00): Samples of each layer that are retrieved from areas in the middle of the test section (from the paver) shall be assigned Laboratory Test Number '3'.

(2) Extra Sample - Is the sample to be saved as a backup for other tests? A "yes"in this column implies that this is a dedicated extra sample saved from future use. A "no" indicates that a sample can be discarded after use.

(3) Sample Storage
   a. Environmentally protected and controlled storeroom at 5-21°C (40-70°F).
   b. Environmentally protected and controlled storeroom at 5-38°C (40-100°F).
   c. Thin-walled tube samples of the subgrade that should be stored in a fully supported condition and at temperatures between 5°C (40°F) and 21°C (70°F) in an environmentally protected storeroom. They shall be stored on their ends and shall always be stored in a vertical position with respect to the longitudinal axis of the tube in the same orientation as that retrieved from the field.

(4) Sample Disposal? - Indicates whether or not a sample can be disposed of after testing. Generally, all samples or portions of samples that are tested are saved until further notice.

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 (1)	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample (2)	Sample Storage (3)	Sample Disposed? (4)
			First	Second	Third	Fourth			
B7	BG04	2	UG09/P48				No	(b)	Yes
B8	BG05	2	UG09/P48				No	(b)	Yes
B9	BG06	2	UG09/P48				No	(b)	Yes

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

Sample Location	Sample Number	Lab Test Number (1)	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample (2)	Sample Storage (3)	Sample Disposed? (4)
			First	Second	Third	Fourth			
B4	BG01	2	SS11/P57				No	(b)	Yes
B5	BG02	2	SS11/P57				No	(b)	Yes
B6	BG03	2	SS11/P57				No	(b)	Yes

TABLE C-6. TRACKING TABLE OF SUBGRADE TESTING IN THE STATE LABORATORY (OR THEIR DESIGNEE)

Sample Location	Sample Number	Lab Test Number (1)	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample (2)	Sample Storage (3)	Sample Disposed? (4)
			First	Second	Third	Fourth			
B1	BS01	2	No testing - samples stored				Yes	(b)	No
B2	BS02	2	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		No	(c)	Yes
A4	TS07	3	SS04/P52	SS08/P56	SS10/P54		No	(c)	Yes
A6	TS11	3	SS04/P52				No	(c)	Yes
A2	TS04	3					Yes	(c)	No
A4	TS08	3					Yes	(c)	No
A6	TS12	3					Yes	(c)	No

TABLE C-7. TRACKING TABLE OF ASPHALTIC CONCRETE TESTING IN THE FHWA-LTPP TESTING CONTRACTOR LABORATORY

Sample Location	Sample Number	Lab Test Number (1)	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample (2)	Sample Storage (3)	Sample Disposed? (4)
			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	1	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C6	CA06	1	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C7	CA07	1	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C8	CA08	1	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	1	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C14	CA14	1	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C15	CA15	1	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C16	CA16	1	AC01/P01	AC02/P02		AC07/P07 (ITS)	No	(a)	Yes

TABLE C-8. TRACKING TABLE OF DENSE GRADED AGGREGATE BASE TESTING IN THE FHWA-LTPP TESTING CONTRACTOR LABORATORY

Sample Location	Sample No.	Lab Test No. (1)	Steps Involved in Laboratory Handling and Testing Sequence								
			Required Laboratory Tests Per Layer						Extra Sample (2)	Sample Storage (3)	Sample Disposed ? (4)
			First	Second	Third	Fourth	Fifth	Sixth			
B7	BG04	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B8	BG05	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B9	BG06	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B7	MG04	2	UG10/P49						No	(b)	Yes
B8	MG05	2	UG10/P49						No	(b)	Yes
B9	MG06	2	UG10/P49						No	(b)	Yes

TABLE C-9. TRACKING TABLE OF LIME-TREATED SUBGRADE TESTING IN THE FHWA-LTPP TESTING CONTRACTOR LABORATORY

Sample Location	Sample No.	Lab Test No. (1)	Steps Involved in Laboratory Handling and Testing Sequence								
			Required Laboratory Tests Per Layer						Extra Sample (2)	Sample Storage (3)	Sample Disposed ? (4)
			First	Second	Third	Fourth	Fifth	Sixth			
B4	BG01	2	SS01/P51	SS02/P42	SS03/P43	SS05/P55	SS07/P46		No	(b)	Yes
B5	BG02	2	SS01/P51	SS02/P42	SS03/P43	SS05/P55	SS07/P46		No	(b)	Yes
B6	BG03	2	SS01/P51	SS02/P42	SS03/P43	SS05/P55	SS07/P46		No	(b)	Yes
B4	MG01	2	SS09/P49	~~SS07/P46~~			ALS 6/17/96		No	(b)	Yes
B5	MG02	2	SS09/P49	~~SS07/P46~~					No	(b)	Yes
B6	MG03	2	SS09/P49	~~SS07/P46~~					No	(b)	Yes

TABLE C-10. TRACKING TABLE OF SUBGRADE TESTING IN THE FHWA-LTPP TESTING CONTRACTOR LABORATORY

Sample Location	Sample No.	Lab Test No. (1)	Steps Involved in Laboratory Handling and Testing Sequence								
			Required Laboratory Tests Per Layer						Extra Sample (2)	Sample Storage (3)	Sample Disposed ? (4)
			First	Second	Third	Fourth	Fifth	Sixth			
B1	BS01	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46 *	No	(b)	Yes
B2	BS02	2	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	2	SS09/P49	~~SS07/P46 *~~					No	(b)	Yes
B2	MS02	2	SS09/P49	~~SS07/P46 *~~					No	(b)	Yes
B3	MS03	2	SS09/P49	~~SS07/P46 *~~					No	(b)	Yes
A1	TS02	3							Yes	(c)	No
A3	TS06	3							Yes	(c)	No
A5	TS10	3							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

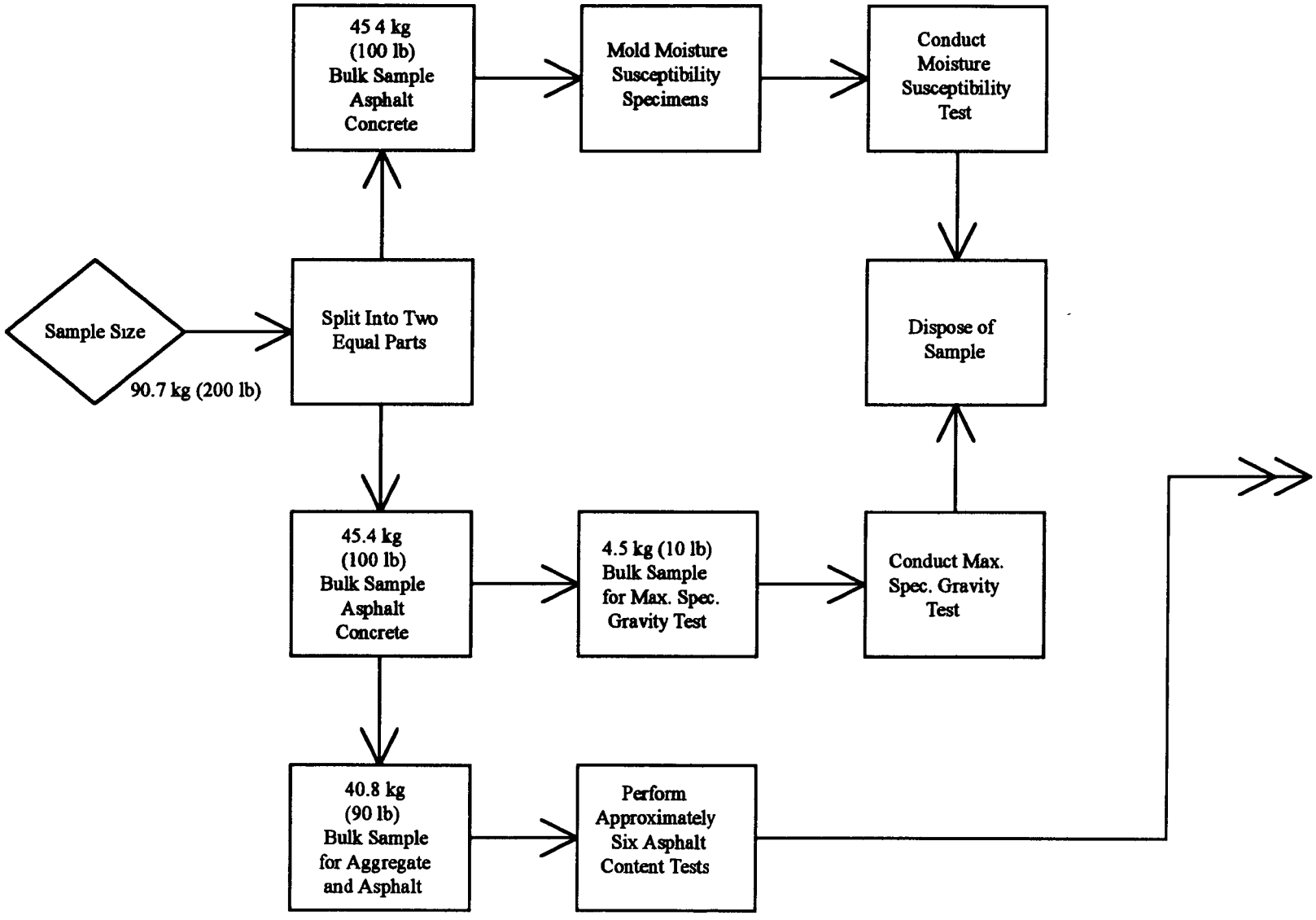


FIGURE C-1. FLOWCHART FOR ASPHALT CONCRETE BULK SAMPLES

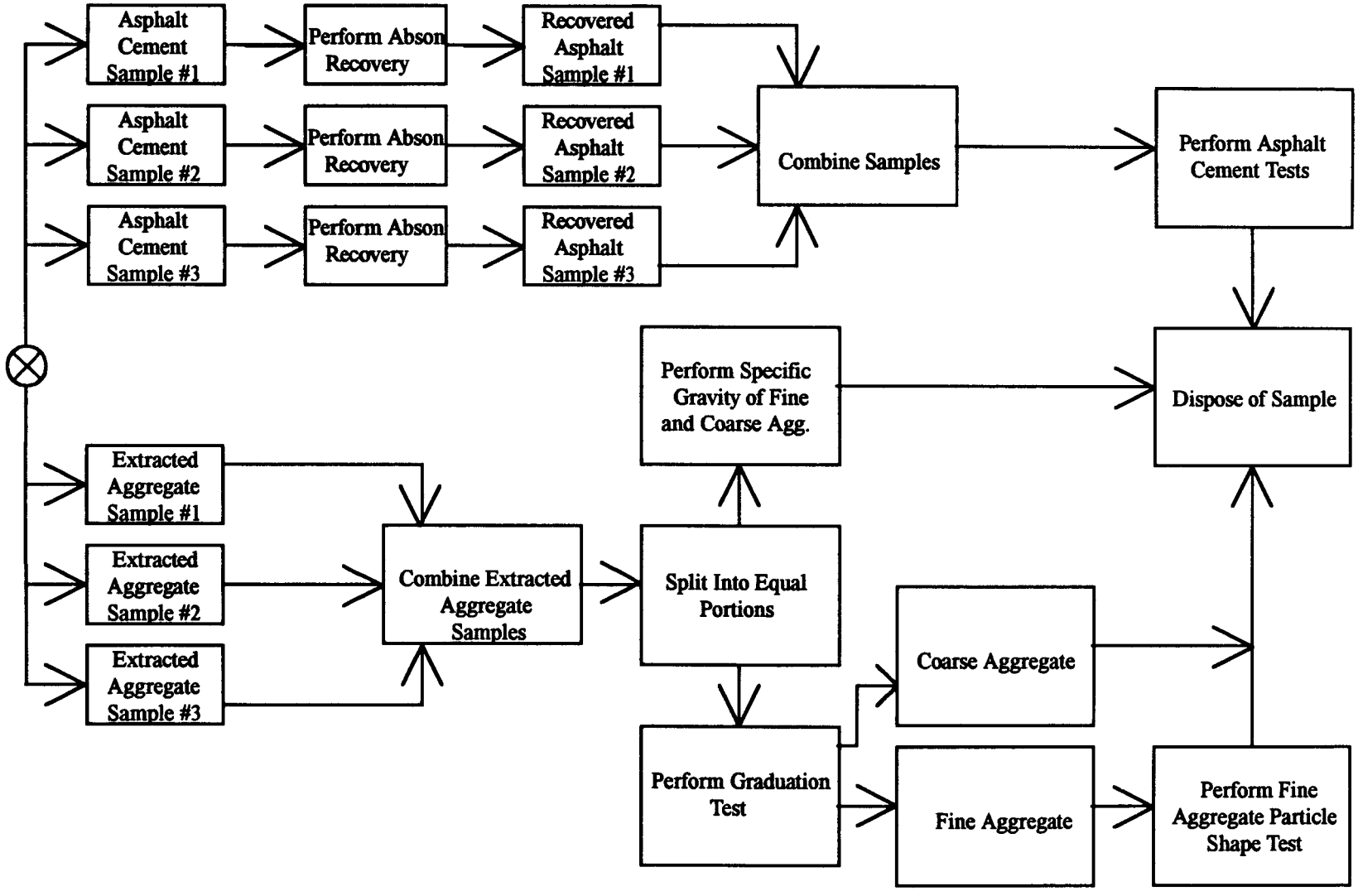


FIGURE C-1. FLOWCHART FOR ASPHALT CONCRETE BULK SAMPLES (Continued)

APPENDIX D

CONSTRUCTION DATA

SPS-8 CONSTRUCTION DATA SHEET 1 PROJECT IDENTIFICATION	* STATE CODE [48] * SPS PROJECT CODE [08] * TEST SECTION NO. [XX]

*1.	DATE OF DATA COLLECTION OR UPDATE (Month/Year)	[07/96]
*2.	STATE HIGHWAY AGENCY (SHA) DISTRICT NUMBER	[17.]
*3.	COUNTY OR PARISH	[041.]
4.	FUNCTIONAL CLASS (SEE TABLE A.2, APPENDIX A)	[09.]
*5.	ROUTE SIGNING (NUMERIC CODE) Interstate... 1 U.S.... 2 State... 3 Other... 4	[4.]
*6.	ROUTE NUMBER	[2223.]
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)	[07/96]
*10.	DATE OPENED TO TRAFFIC (Month/Year)	[07/96]
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	[404.25]
*14.	ELEVATION	[331]
15.	LATITUDE	[30° 46' 00."]
*16.	LONGITUDE	[96° 24' 00."]
17.	ADDITIONAL LOCATION INFORMATION (SIGNIFICANT LANDMARKS): [480802 BEGINS 2.2 MILES EAST OF OSR 4.4 MILES WEST OF FM 974 TRM 402.638 TRM 408.624]	
18.	HPMS SAMPLE NUMBER (HPMS ITEM 28)	[ ]
19.	HPMS SECTION SUBDIVISION (HPMS ITEM 29)	[.]

PREPARER Jerome F. Dill EMPLOYER BRE DATE 10/11/96

SPS-8 CONSTRUCTION DATA SHEET 3 REFERENCE PROJECT STATION TABLE	* STATE CODE [48] * SPS PROJECT CODE [808] * 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	480802	0+00	5+00	3	
2	480801	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.

Timothy J. Barth SRCO DATE 7/23/96

SPS-8 CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [4 8] * SPS PROJECT CODE [8 1] * TEST SECTION NO. [0 2]

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

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.]
*6.	TOTAL WIDTH (FEET)	[_ _.]	[_ 4.]
*7.	PAVED WIDTH (FEET)	[_ _.]	[_ 4.]
8.	SHOULDER BASE TYPE (CODES-TABLE A.6)	[_ _.]	[2 3.]
9.	SURFACE THICKNESS (INCHES)	[_ _._ _]	[_ 7. 0]
10.	SHOULDER BASE THICKNESS (INCHES)	[_ _._ _]	[1 2. 0]
11.	DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES)		[_. N]
12.	SPACING OF LATERALS (FEET)		[_ _ N.]

SRCO 7/23/96

SPS-8 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [4 8] * 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 2]				
2	[0 6]	[4 2]	[10.0]			
3	[0 5]	[2 3]	[10.7]	9.4	12.5	0.8
4	[0 4]	[2 8]	[5.5]			
5	[0 3]	[0 1]	[2.5]			
6	[ ]	[ ]	[ ]			
7	[ ]	[ ]	[ ]			
8	[ ]	[ ]	[ ]			
9	[ ]	[ ]	[ ]			
10	[ ]	[ ]	[ ]			
11	[ ]	[ ]	[ ]			
12	[ ]	[ ]	[ ]			
13	[ ]	[ ]	[ ]			
14	[ ]	[ ]	[ ]			
15	[ ]	[ ]	[ ]			

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (FEET) (Rock, Stone, Dense Shale) [.]
>40' (No Refusal)

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 _____ EMPLOYER _____ DATE 10/7/96

SPS-8 CONSTRUCTION DATA SHEET 5 PLANT-MIXED ASPHALT BOUND LAYERS AGGREGATE PROPERTIES	* STATE CODE [4 8] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 2]

*1. LAYER NUMBER (FROM SHEET 4) B-mix [4]

		TYPE	PERCENT
	COMPOSITION OF COARSE AGGREGATE		
*2.	Crushed Stone... 1 Gravel... 2 Crushed Gravel... 3	[1]	[1 0 0.]
*3.	Crushed Slag... 4 Manufactured Lightweight... 5	[__]	[__ __ __.]
*4.	Other (Specify)... 6 _____	[__]	[__ __ __.]
	COMPOSITION OF FINE AGGREGATE	TYPE	PERCENT
*5.	Natural Sand... 1 (Field Sand)	[1]	[1 0 0.]
*6.	Crushed or Manufactured Sand (From Crushed Gravel or	[__]	[__ __ __.]
*7.	Stone... 2 Recycled Concrete... 3 Other (Specify)... 4 _____	[__]	[__ __ __.]

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

BULK SPECIFIC GRAVITIES:

*9. Coarse Aggregate (AASHTO T85 or ASTM C127) $\frac{.4 + .22}{\frac{.4}{2.588} + \frac{.22}{2.493}} = 2.553$ [2.5 5 3]

*10. Fine Aggregate (AASHTO T84 or ASTM C128) $\frac{.23 + .15}{\frac{.23}{2.636} + \frac{.15}{2.631}} = 2.634$ [2.6 3 4]

*11. Mineral Filler (AASHTO T100 or ASTM D854) [__.N/A__]

*12. Aggregate Combination (Calculated) ✓ [2.5 8 3]

13. Effective Specific Gravity of Aggregate Combination (Calculated) $\frac{100 - 5.4}{\frac{100}{2.441} - \frac{5.4}{1.033}} = 2.446$ [2.6 4 6]

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 Lane W. Dunman EMPLOYER BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 5 PLANT-MIXED ASPHALT BOUND LAYERS AGGREGATE PROPERTIES	* STATE CODE [4 8] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 2]

*1. LAYER NUMBER (FROM SHEET 4) D-mix [5]

	COMPOSITION OF COARSE AGGREGATE	TYPE	PERCENT
*2.	Crushed Stone... 1 Gravel... 2 Crushed Gravel... 3	[1]	[1 0 0.]
*3.	Crushed Slag... 4 Manufactured Lightweight... 5	[__]	[__ __ __.]
*4.	Other (Specify)... 6 _____	[__]	[__ __ __.]
	COMPOSITION OF FINE AGGREGATE	TYPE	PERCENT
*5.	Natural Sand... 1	[1]	[1 0 0.]
*6.	Crushed or Manufactured Sand (From Crushed Gravel or	[__]	[__ __ __.]
*7.	Stone... 2 Recycled Concrete... 3 Other (Specify)... 4 _____	[__]	[__ __ __.]

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

BULK SPECIFIC GRAVITIES:

*9. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.604]

*10. Fine Aggregate (AASHTO T84 or ASTM C128) [2.674]

*11. Mineral Filler (AASHTO T100 or ASTM D854) [N/A]

*12. Aggregate Combination (Calculated) ✓ [2.632]

13. Effective Specific Gravity of Aggregate Combination (Calculated) [2.630]

$$G_{se} = \frac{100 - 5.4}{\frac{100}{2.42} - \frac{5.4}{1.03}} = 2.630$$

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) 31.

PREPARER Frank M. Drum EMPLOYER BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 6 PLANT-MIXED ASPHALT BOUND LAYERS ASPHALT CEMENT PROPERTIES	* STATE CODE [4 8] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 2]

*1. LAYER NUMBER (FROM SHEET 4) B-mix [4]

*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 4]
(IF OTHER, SPECIFY) E.n.A - Baytown, TX

4. SPECIFIC GRAVITY OF ASPHALT CEMENT [1.0 3 3]
(AASHTO T228)

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

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

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

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

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

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

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

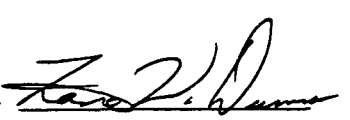
11. DUCTILITY AT 39.2°F (CM)
(AASHTO T51) [_ _ _.]

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

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

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

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

PREPARER  EMPLOYER BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 6 PLANT-MIXED ASPHALT BOUND LAYERS ASPHALT CEMENT PROPERTIES	* STATE CODE [4 8] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 2]

*1. LAYER NUMBER (FROM SHEET 4) D-mix [5]

*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 4]
(IF OTHER, SPECIFY) Fina - Baytown, TX

4. SPECIFIC GRAVITY OF ASPHALT CEMENT [1.0 3 4]
(AASHTO T228)

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

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

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

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

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

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

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

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

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

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

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

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

PREPARER Tara W. Thomas EMPLOYER BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 7 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES	* STATE CODE [49] * SPS PROJECT CODE [__8] * TEST SECTION NO. [02]

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

*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) [2.430]

BULK SPECIFIC GRAVITY (ASTM D1188)

*4. MEAN [2.242] NUMBER OF TESTS [__8.]

5. MINIMUM [2.205] MAXIMUM [2.289]

6. STD. DEV. [0.032]

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

*7. MEAN [5.4__] NUMBER OF SAMPLES [__1.]

8. MINIMUM [__.___] MAXIMUM [__.___]

9. STD. DEV. [__.___]

PERCENT AIR VOIDS

*10. MEAN [7.737] NUMBER OF SAMPLES [__1.]

11. MINIMUM [__.___] MAXIMUM [__.___]

12. STD. DEV. [__.___]

*13. VOIDS IN MINERAL AGGREGATE (PERCENT) [16.3]

*14. EFFECTIVE ASPHALT CONTENT (PERCENT) [__4.7]

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

*16. NUMBER OF BLOWS [__]

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

*18. HVEEM STABILITY (AASHTO T246 OR ASTM D1561) [__39.]

*19. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) (AASHTO T246 OR ASTM 1561) [__306.]

Tom W. Dunn BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 7 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES	* STATE CODE [4 9] * SPS PROJECT CODE [_ 8] * TEST SECTION NO. [0 1]

*1. LAYER NUMBER (FROM SHEET 4) D-Mix [5]

*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) [2.425]

BULK SPECIFIC GRAVITY (ASTM D1188)

*4. MEAN [2.331] NUMBER OF TESTS [_ 3.]

5. MINIMUM [2.329] MAXIMUM [2.332]

6. STD. DEV. [0.001]

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

*7. MEAN [5.4 _ _] NUMBER OF SAMPLES [_ _.]

8. MINIMUM [_._ _ _] MAXIMUM [_._ _ _]

9. STD. DEV. [_._ _ _]

PERCENT AIR VOIDS

*10. MEAN [3.866] NUMBER OF SAMPLES [_ 3.]

11. MINIMUM [3.8 _ _] MAXIMUM [4.0 _ _]

12 STD. DEV. [0.115]

*13. VOIDS IN MINERAL AGGREGATE (PERCENT) [16.2]

*14. EFFECTIVE ASPHALT CONTENT (PERCENT) [_ 5.4]

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

*16. NUMBER OF BLOWS [_ _]

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

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

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

Lana W. Dunnar BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 8 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES (CONTINUED)	* STATE CODE [4 8] * SPS PROJECT CODE [_ 8] * TEST SECTION NO. [0 2]

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

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

*3. TYPE ASPHALT PLANT [2]

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

OTHER (SPECIFY)... 3 _____

*4. TYPE OF ANTISTRIPPING AGENT USED [N/A]
(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.) [__ __.__]

Tom W. Duncan BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 8 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES (CONTINUED)	* STATE CODE [4 8] * SPS PROJECT CODE [_ 8] * TEST SECTION NO. [0 1]

*1. LAYER NUMBER (FROM SHEET 4) D-mix [5]

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

*3. TYPE ASPHALT PLANT [2]

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

OTHER (SPECIFY)... 3 _____

*4. TYPE OF ANTISTRIPPING AGENT USED [N/A]
(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.)

Lee D. Duncan ORE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 9 PLANT-MIXED ASPHALT BOUND LAYERS PLACEMENT DATA	* STATE CODE [48] * SPS PROJECT CODE [8] * TEST SECTION NO. [02]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [07-16-96]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [07-17-96]

*3 ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers
Plant 1	[2]	YOUNG BROS.	[11]	[25]	[4] [5] [ ]
Plant 2	[ ]		[ ]	[ ]	[ ] [ ] [ ]
Plant 3	[ ]		[ ]	[ ]	[ ] [ ] [ ]

Plant Type: Batch..... 1 Drum Mix.... 2 Other.. 3 Specify _____

4. MANUFACTURER OF ASPHALT CONCRETE PAVER CATERPILLAR

5. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER AP-1000

6. SINGLE PASS LAYDOWN WIDTH (Feet) (5.9 m) [19.4]

7. AC BINDER COURSE LIFT
   Layer Number [4]
   Nominal First Lift Placement Thickness (Inches) (5" COMPACTED) [6.0]
   Nominal Second Lift Placement Thickness (Inches) [.]

8. AC SURFACE COURSE LIFT
   Layer Number [5]
   Nominal First Lift Placement Thickness (Inches) (2" COMPACTED) [2.3]
   Nominal Second Lift Placement Thickness (Inches) [.]

9. SURFACE FRICTION COURSE (If Placed)
   Layer Number [N/A]
   Nominal Placement Thickness (Inches) [.]

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

11. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2
    (specify offset from O/S feet) [0.0]

12. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.) Trucks had at least 10-20 min. to wait before getting emptied out.

Lee W. Nunnar EMPLOYER BRE DATE 7/19/96

SPS-8 CONSTRUCTION DATA
SHEET 10
PLANT-MIXED ASPHALT BOUND LAYERS
COMPACTION DATA

* STATE CODE [48]
* SPS PROJECT CODE [8]
* TEST SECTION NO. [02]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [07-16-96]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [07-17-96]
*3. LAYER NUMBER [4]

*4. MIXING TEMPERATURE (°F) [300.]

5. LAYDOWN TEMPERATURES (°F)
Mean..... 295.
Minimum..... 270.
Standard Deviation... 12.2
Number of Tests ..... 06.
Maximum..... 300.

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	___.__				
7	B	Steel-Whl Tandem	___.__				
8	C	Steel-Whl Tandem	___.__				
9	D	Steel-Whl Tandem	___.__				
10	E	Pneumatic-Tired	25.0	____.			
1	F	Pneumatic-Tired	___.__	____.			
12	G	Pneumatic-Tired	___.__	____.			
13	H	Pneumatic-Tired	___.__	____.			
14	I	Single-Drum Vibr.	11.0		____.	___.	___.__
15	J	Single-Drum Vibr.	___.__		____.	___.	___.__
16	K	Single-Drum Vibr.	___.__		____.	___.	___.__
17	L	Single-Drum Vibr.	___.__		____.	___.	___.__
18	M	Double-Drum Vibr.	16.0		____.	___.	___.__
19	N	Double-Drum Vibr.	___.__		____.	___.	___.__
20	O	Double-Drum Vibr.	___.__		____.	___.	___.__
21	P	Double-Drum Vibr.	___.__		____.	___.	___.__
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	___	___	___
24	Coverages	05.	___.	___.	___.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	___	___	___
26	Coverages	11.	___.	___.	___.
	FINAL				
27	Roller Code (A-Q)	F	___	___	___
28	Coverages	05.	___.	___.	___.
29	Air Temperature (°F)	95.	___.	___.	___.
30	Compacted Thickness (In)	5.0	___.__	___.__	___.__
31	Curing Period (Days)	0.0	___.__	___.__	___.__

[redacted] EMPLOYEE BRE DATE 7-19-96

SPS-8 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS COMPACTION DATA	* STATE CODE [48] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [07-16-96]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [07-17-96]
*3. LAYER NUMBER [5]

*4 MIXING TEMPERATURE (°F) [300.]

5. LAYDOWN TEMPERATURES (°F)
Mean..... 295.
Minimum..... 280.
Standard Deviation... 10.0
Number of Tests ..... 04.
Maximum..... 300.

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem					
7	B	Steel-Whl Tandem					
8	C	Steel-Whl Tandem					
9	D	Steel-Whl Tandem					
10	E	Pneumatic-Tired	25.0				
11	F	Pneumatic-Tired					
12	G	Pneumatic-Tired					
13	H	Pneumatic-Tired					
14	I	Single-Drum Vibr.	11.0				
15	J	Single-Drum Vibr.					
16	K	Single-Drum Vibr.					
17	L	Single-Drum Vibr.					
18	M	Double-Drum Vibr.	16.0				
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			
24	Coverages	05.			
25	INTERMEDIATE Roller Code (A-Q)	E			
26	Coverages	11.			
27	FINAL Roller Code (A-Q)	F			
28	Coverages	05.			
29	Air Temperature (°F)	90.			
30	Compacted Thickness (In)	5.0			
31	Curing Period (Days)	0.0			

PREPARER BRE EMPLOYER [signature] DATE 7-19-96

SPS-8 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS DENSITY AND PROFILE DATA	* STATE CODE [4/8] * SPS PROJECT CODE [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	___ ___	1 2	___ ___
Average (pcf)	___.___	142.5	___.___
Maximum (pcf)	___.___	151.4	___.___
Minimum (pcf)	___.___	137.2	___.___
Standard Deviation (pcf)	___.___	3.4	___.___
Layer Number	___ ___	5	___ ___

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

2. MANUFACTURER OF NUCLEAR DENSITY GAUGE — TROXLER

3. NUCLEAR DENSITY GAUGE MODEL NUMBER — 3430

4. NUCLEAR DENSITY GAUGE IDENTIFICATION NUMBER — 17737

5. NUCLEAR GAUGE COUNT RATE FOR STANDARDIZATION — 3053
MOIST COUNT (5564)

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 _____ EMPLOYER Dan E. Dill DATE 10/7/96

SPS-8 CONSTRUCTION DATA SHEET 12 LAYER THICKNESS MEASUREMENTS	* STATE CODE [48] * SPS PROJECT CODE [__ 8] * 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	11.3	——.—	7.8	——.—
	3	11.2	——.—	7.7	——.—
	6	10.8	——.—	7.8	——.—
	9	10.2	——.—	8.2	——.—
	12	9.8	——.—	8.5	——.—
0+50	0	9.7	——.—	8.0	——.—
	3	9.5	——.—	8.3	——.—
	6	9.6	——.—	8.4	——.—
	9	9.4	——.—	8.9	——.—
	12	9.3	——.—	9.2	——.—
1+00	0	10.4	——.—	8.0	——.—
	3	10.7	——.—	7.9	——.—
	6	11.4	——.—	7.6	——.—
	9	11.5	——.—	7.4	——.—
	12	11.3	——.—	8.3	——.—
1+50	0	10.1	——.—	7.9	——.—
	3	10.4	——.—	7.7	——.—
	6	10.7	——.—	7.7	——.—
	9	11.3	——.—	7.4	——.—
	12	11.0	——.—	8.3	——.—
2+00	0	9.6	——.—	8.4	——.—
	3	9.5	——.—	8.4	——.—
	6	10.3	——.—	7.9	——.—
	9	10.7	——.—	7.7	——.—
	12	10.6	——.—	8.2	——.—
2+50	0	10.6	——.—	8.5	——.—
	3	10.3	——.—	8.5	——.—
	6	10.0	——.—	8.6	——.—
	9	9.7	——.—	8.8	——.—
	12	9.4	——.—	9.2	——.—
3+00	0	11.6	——.—	7.9	——.—
	3	11.9	——.—	7.6	——.—
	6	11.5	——.—	7.6	——.—
	9	11.4	——.—	7.7	——.—
	12	10.9	——.—	8.4	——.—
LAYER NUMBER		3	——	5	——

EMPLOYER James C. Dell DATE 10/2/96

SPS-8 CONSTRUCTION DATA
SHEET 12
LAYER THICKNESS MEASUREMENTS

* STATE CODE [48]
* SPS PROJECT CODE [__ 8]
* TEST SECTION NO. [02]

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	10.3	——.—	7.7	——.—
	3	10.2	——.—	7.7	——.—
	6	9.8	——.—	7.9	——.—
	9	9.8	——.—	8.2	——.—
	12	9.8	——.—	8.6	——.—
4+00	0	10.7	——.—	7.7	——.—
	3	10.8	——.—	7.6	——.—
	6	11.5	——.—	7.2	——.—
	9	11.6	——.—	7.3	——.—
	12	11.4	——.—	7.9	——.—
4+50	0	10.8	——.—	7.6	——.—
	3	11.3	——.—	7.3	——.—
	6	11.4	——.—	7.3	——.—
	9	11.5	——.—	7.3	——.—
	12	12.5	——.—	6.6	——.—
5+00	0	11.6	——.—	6.6	——.—
	3	11.6	——.—	6.6	——.—
	6	11.6	——.—	6.7	——.—
	9	11.4	——.—	7.1	——.—
	12	10.9	——.—	7.9	——.—
—+—		——.—	——.—	——.—	——.—
		——.—	——.—	——.—	——.—
		——.—	——.—	——.—	——.—
		——.—	——.—	——.—	——.—
		——.—	——.—	——.—	——.—
—+—	AVG	10.7	——.—	7.9	——.—
	MIN	9.4	——.—	6.6	——.—
	MAX	12.5	——.—	9.3	——.—
	STD	0.8	——.—	0.6	——.—
		——.—	——.—	——.—	——.—
—+—		——.—	——.—	——.—	——.—
		——.—	——.—	——.—	——.—
		——.—	——.—	——.—	——.—
		——.—	——.—	——.—	——.—
		——.—	——.—	——.—	——.—
LAYER NUMBER		3	——	5	——

Jerome C. Daleiden 10/7/96
DATE

SPS-8 CONSTRUCTION DATA SHEET 13 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [48] * SPS PROJECT CODE [__8] * TEST SECTION NO. [02]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [04-05-96]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [04-22-96]

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

PRIMARY COMPACTION EQUIPMENT

*4. CODE TYPE [3]

COMPACTION TYPE CODES
Pneumatic - Tired... 1 Steel Wheel Tandem... 2 Single Drum Vibr.... 3
Double Drum Vibr.... 4
Other (Specify)... 5 _____

*5. GROSS WEIGHT (TONS) [__ __.__]

*6. LIFT THICKNESSES

Nominal First Lift Placement Thickness (inches)	04/06/96	[__4]
Nominal Second Lift Placement Thickness (inches)	04/11/96	[__4]
Nominal Third Lift Placement Thickness (inches)	04/22/96	[__4]
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.) _____

_____

_____

_____

---- --- EMPLOYER _____ DATE _____

SPS-8 CONSTRUCTION DATA SHEET 14 SUBGRADE PREPARATION	* STATE CODE [48] * SPS PROJECT CODE [8] * TEST SECTION NO. [02]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [03-07-96]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [03-15-96]

PRIMARY COMPACTION EQUIPMENT

INITIAL MIXING W/ LIME THURSDAY 3/7/96
FINAL MIXING W/ LIME WEDNESDAY 3/13/96
COMPACTION 3/15/96

*3. CODE TYPE [3]

COMPACTION EQUIPMENT TYPE CODES
Sheepsfoot... 1 Pneumatic Tired... 2 Steel Wheel Tandem... 3
Single Drum Vibr.... 4 Double Drum Vibr.... 5
Other (Specify)... 6 _____

*4. GROSS WEIGHT (TONS) [__ __.__]

		TYPE	PERCENT
*5.	STABILIZING AGENT 1	[2]	[10.0]
*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.) _____

_____

_____

_____

TYPIST'S INITIALS DATE

SPS-8 CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [4 8] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [3 0 1]

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

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.]
*6.	TOTAL WIDTH (FEET)	[__ __.]	[__ 4.]
*7.	PAVED WIDTH (FEET)	[__ __.]	[__ 4.]
8.	SHOULDER BASE TYPE (CODES-TABLE A.6)	[__ __.]	[2 3.]
9.	SURFACE THICKNESS (INCHES)	[__ __. __]	[__ 4. 0]
10.	SHOULDER BASE THICKNESS (INCHES)	[__ __. __]	[__ 8. 0]
11.	DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES)		[__. N]
12.	SPACING OF LATERALS (FEET)		[__ __ N.]

PREPARER Timothy J. Maitas EMPLOYER SRCO DATE 7/23/96

SPS-8 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [4 8] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 1]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 2]				
2	[0 6]	[4 2]	[10.0]			
3	[0 5]	[2 3]	[8.5]	7.1	10.1	0.8
4	[0 4]	[2 8]	[2.5]			
5	[0 3]	[0 1]	[2.5]			
6	[ ]	[ ]	[ ]			
7	[ ]	[ ]	[ ]			
8	[ ]	[ ]	[ ]			
9	[ ]	[ ]	[ ]			
10	[ ]	[ ]	[ ]			
11	[ ]	[ ]	[ ]			
12	[ ]	[ ]	[ ]			
13	[ ]	[ ]	[ ]			
14	[ ]	[ ]	[ ]			
15	[ ]	[ ]	[ ]			

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (FEET) (Rock, Stone, Dense Shale) [.]
>40' (No refusal)

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 _____ EMPLOYER _____ DATE _____

SPS-8 CONSTRUCTION DATA SHEET 5 PLANT-MIXED ASPHALT BOUND LAYERS AGGREGATE PROPERTIES	* STATE CODE [48] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

*1. LAYER NUMBER (FROM SHEET 4) B-mix [4]

		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 (Field Sand)	[1]	[100.]
*6.	Crushed or Manufactured Sand (From Crushed Gravel or	[__]	[___.]
*7.	Stone... 2 Recycled Concrete... 3 Other (Specify)... 4 _____	[__]	[___.]

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

BULK SPECIFIC GRAVITIES:

*9. Coarse Aggregate (AASHTO T85 or ASTM C127) $\frac{.4 + .22}{\frac{.4}{2.588} + \frac{.22}{2.493}} = 2.553$ [2.553]

*10. Fine Aggregate (AASHTO T84 or ASTM C128) $\frac{.23 + .15}{\frac{.23}{2.636} + \frac{.15}{2.631}} = 2.634$ [2.634]

*11. Mineral Filler (AASHTO T100 or ASTM D854) [__.N/A__]

*12. Aggregate Combination (Calculated) ✓ [2.583]

13. Effective Specific Gravity of Aggregate Combination (Calculated) $\frac{100 - 5.4}{\frac{100}{2.441} - \frac{5.4}{1.033}} = 2.646$ [2.646]

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 Lore W. Wunna EMPLOYER BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 5 PLANT-MIXED ASPHALT BOUND LAYERS AGGREGATE PROPERTIES	* STATE CODE [48] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

*1. LAYER NUMBER (FROM SHEET 4) D-mix [5]

		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]	[100.]
*6.	Crushed or Manufactured Sand (From Crushed Gravel or	[__]	[___.]
*7.	Stone... 2 Recycled Concrete... 3 Other (Specify)... 4 _____	[__]	[___.]

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

BULK SPECIFIC GRAVITIES:

*9. G_{sb} Coarse Aggregate (AASHTO T85 or ASTM C127) $\frac{(.27+.32)}{\frac{.27}{2.598}+\frac{.32}{2.609}} = 2.60395$ [2.604]

*10. Fine Aggregate (AASHTO T84 or ASTM C128) [2.674]

11. Mineral Filler (AASHTO T100 or ASTM D854) $\frac{.16+.15+.1}{\frac{.16}{2.667}+\frac{.15}{2.675}+\frac{.1}{2.685}} = 2.6743$ [N/A]

*12. Aggregate Combination (Calculated) ✓ [2.632]

13. Effective Specific Gravity of Aggregate Combination (Calculated) $G_{se} = \frac{100-6.40}{\frac{100}{2.625}-\frac{5.40}{1.034}} = 2.630$ [2.630]

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) 31.

PREPARER Jane L. Dunnan EMPLOYER BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 6 PLANT-MIXED ASPHALT BOUND LAYERS ASPHALT CEMENT PROPERTIES	* STATE CODE [48] * SPS PROJECT CODE [_8] * TEST SECTION NO. [01]

*1. LAYER NUMBER (FROM SHEET 4) B-mix [4]

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

*3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [64]
(IF OTHER, SPECIFY) Fina, Baytown, TX

4. SPECIFIC GRAVITY OF ASPHALT CEMENT (AASHTO T228) [1.033]

GENERAL ASPHALT CEMENT PROPERTIES (If available from supplier)

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

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

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

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

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

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

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

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

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

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

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

Tom W. Dunn BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 6 PLANT-MIXED ASPHALT BOUND LAYERS ASPHALT CEMENT PROPERTIES	* STATE CODE [48] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

*1. LAYER NUMBER (FROM SHEET 4) D-mix [5]

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

*3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [64]
(IF OTHER, SPECIFY) Fina, Baytown, TX

4. SPECIFIC GRAVITY OF ASPHALT CEMENT [1.034]
(AASHTO T228)

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

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

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

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

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

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

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

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

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

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

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

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

PREPARER Tara V. Dunn EMPLOYER BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 7 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES	* STATE CODE [4 9] * SPS PROJECT CODE [_ 8] * TEST SECTION NO. [0 1]

*1. LAYER NUMBER (FROM SHEET 4) B-mix [4]

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

*3. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) 2.430 2.40. ~~2.441~~ [2.4 4 1]
(AASHTO T209 OR ASTM D2041)

BULK SPECIFIC GRAVITY (ASTM D1188)

*4. MEAN [2.2 4 2] NUMBER OF TESTS [_ 8.]

5. MINIMUM [2.2 0 5] MAXIMUM [2.2 8 9]

6. STD. DEV. [0.0 3 2]

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

*7. MEAN [5.4 _ _] NUMBER OF SAMPLES [_ _.]

8. MINIMUM [_._ _ _] MAXIMUM [_._ _ _]

9. STD. DEV. [_._ _ _]

PERCENT AIR VOIDS $= 100 \times \left(1 - \frac{G_{mb}}{G_{mm}}\right) = 100\left(1 - \frac{2.242}{2.430}\right) = 7.7366$

*10. MEAN [7.7 3 7] NUMBER OF SAMPLES [_ _.]

11. MINIMUM [_._ _ _] MAXIMUM [_._ _ _]

12 STD. DEV. [_._ _ _]

*13. VOIDS IN MINERAL AGGREGATE (PERCENT) $= 100 - \frac{(G_{mb})(P_s)}{G_{sb}} = 100 - \frac{(2.242)(94.6)}{2.583}$ [1 6.3]

*14. EFFECTIVE ASPHALT CONTENT (PERCENT)= See Backside [_ 4.7]

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

*16. NUMBER OF BLOWS [_ _]

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

*18. HVEEM STABILITY (AASHTO T246 OR ASTM D1561) [_ 3 9.]

*19. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) [_ 3 0 6.]
(AASHTO T246 OR ASTM 1561)

ENTERED BY DATE _____

SPS-8 CONSTRUCTION DATA SHEET 7 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES	* STATE CODE [4 9] * SPS PROJECT CODE [_ 8] * TEST SECTION NO. [0 1]

*1. LAYER NUMBER (FROM SHEET 4) D-mix [5]

*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) [2.425]

BULK SPECIFIC GRAVITY (ASTM D1188)

*4. MEAN [2.331] NUMBER OF TESTS [_ 3.]

5. MINIMUM [2.329] MAXIMUM [2.332]

6. STD. DEV. [0.001]

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

*7. MEAN [5.4 _ _] NUMBER OF SAMPLES [_ _.]

8. MINIMUM [_._ _ _] MAXIMUM [_._ _ _]

9. STD. DEV. [_._ _ _]

PERCENT AIR VOIDS

*10. MEAN [3.866] NUMBER OF SAMPLES [_ 3.]

11. MINIMUM [3.8 _ _] MAXIMUM [4.0 _ _]

12 STD. DEV. [0.115]

*13. VOIDS IN MINERAL AGGREGATE (PERCENT): $100-\frac{(2.331)(94.6)}{2.632}$ = [16.2]

*14. EFFECTIVE ASPHALT CONTENT (PERCENT) see backside [_ 5.4]

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

*16. NUMBER OF BLOWS [_ _]

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

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

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

Tom W. Duncan BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 8 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES (CONTINUED)	* STATE CODE [4 8] * SPS PROJECT CODE [_ 8] * TEST SECTION NO. [0 1]

*1. LAYER NUMBER (FROM SHEET 4) B-m·x [4]

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

*3. TYPE ASPHALT PLANT [2]

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

OTHER (SPECIFY)... 3 _____

*4. TYPE OF ANTISTRIPPING AGENT USED [N/A]
(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.) [__ __.__]

Lore V. Duncan BRE DATE 7/29/96

SPS-8 CONSTRUCTION DATA SHEET 8 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES (CONTINUED)	* STATE CODE [4 8] * SPS PROJECT CODE [_ 8] * TEST SECTION NO. [0 1]

*1. LAYER NUMBER (FROM SHEET 4) D-mix [5]

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

*3. TYPE ASPHALT PLANT [2]

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

OTHER (SPECIFY)... 3 _____

*4. TYPE OF ANTISTRIPPING AGENT USED [N/A]
(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.) [_ _._]

Tara W. Dunn BRE 7/27/96

SPS-8 CONSTRUCTION DATA SHEET 9 PLANT-MIXED ASPHALT BOUND LAYERS PLACEMENT DATA	* STATE CODE [4 8] * SPS PROJECT CODE [_ 8] * TEST SECTION NO. [0 1] (01)

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 7-1 6-9 6]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 7-1 7-9 6]

*3 ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers
Plant 1	[2]	Young Bros.	[_ 1 1]	[2 5]	[4] [5] [_]
Plant 2	[_]	_____	[_ _ _]	[_ _]	[_] [_] [_]
Plant 3	[_]	_____	[_ _ _]	[_ _]	[_] [_] [_]

Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify_____

4. MANUFACTURER OF ASPHALT CONCRETE PAVER Caterpillar

5. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER AP-1000

6. SINGLE PASS LAYDOWN WIDTH (Feet) (5.9m) [1 9.4]

7. AC BINDER COURSE LIFT
   Layer Number [_ 4]
   Nominal First Lift Placement Thickness (Inches) (2" Compacted) [2.3]
   Nominal Second Lift Placement Thickness (Inches) [_._]

8. AC SURFACE COURSE LIFT
   Layer Number [_ 5]
   Nominal First Lift Placement Thickness (Inches) (2" Compacted) [2.3]
   Nominal Second Lift Placement Thickness (Inches) [_._]

9. SURFACE FRICTION COURSE (If Placed)
   Layer Number [N/A]
   Nominal Placement Thickness (Inches) [_._]

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

11. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2
    (specify offset from O/S feet) [_ 0.0]

12. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.) Trucks had 10-20 min lag time before unloading

PREPARER Lane W. Dunn EMPLOYER BRE DATE 7/19/96

SPS-8 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS COMPACTION DATA	* STATE CODE [48] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [07-16-96]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [07-17-96]
*3. LAYER NUMBER [4]

*4. MIXING TEMPERATURE (°F) [300.]

5. LAYDOWN TEMPERATURES (°F)
Mean..... 295.
Minimum..... 270.
Standard Deviation... 12.2
Number of Tests ..... 06.
Maximum..... 300.

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem					
7	B	Steel-Whl Tandem					
8	C	Steel-Whl Tandem					
9	D	Steel-Whl Tandem					
10	E	Pneumatic-Tired	25.0				
11	F	Pneumatic-Tired					
12	G	Pneumatic-Tired					
13	H	Pneumatic-Tired					
14	I	Single-Drum Vibr.	11.0				
15	J	Single-Drum Vibr.					
16	K	Single-Drum Vibr.					
17	L	Single-Drum Vibr.					
18	M	Double-Drum Vibr.	16.0				
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			
24	Coverages	05.			
25	INTERMEDIATE Roller Code (A-Q)	E			
26	Coverages	11.			
27	FINAL Roller Code (A-Q)	I			
28	Coverages	05.			
29	Air Temperature (°F)	95.			
30	Compacted Thickness (In)	2.0			
31	Curing Period (Days)	0.0			

PREPARER Lance V. Dunner EMPLOYER BRE DATE 7-19-96

SPS-8 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS COMPACTION DATA	* STATE CODE [48] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [07-16-96]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [07-17-96]
*3. LAYER NUMBER [5]

*4. MIXING TEMPERATURE (°F) [300.]

5. LAYDOWN TEMPERATURES (°F)
Mean..... 295.
Minimum..... 280.
Standard Deviation... 10.0
Number of Tests ..... 04.
Maximum..... 300.

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem					
7	B	Steel-Whl Tandem					
8	C	Steel-Whl Tandem					
9	D	Steel-Whl Tandem					
→10	E	Pneumatic-Tired	25.0				
11	F	Pneumatic-Tired					
12	G	Pneumatic-Tired					
13	H	Pneumatic-Tired					
→14	I	Single-Drum Vibr.	11.0				
15	J	Single-Drum Vibr.					
16	K	Single-Drum Vibr.					
17	L	Single-Drum Vibr.					
•18	M	Double-Drum Vibr.	16.0				
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			
24	Coverages	05.			
25	INTERMEDIATE Roller Code (A-Q)	E			
26	Coverages	11.			
27	FINAL Roller Code (A-Q)	I			
28	Coverages	05.			
29	Air Temperature (°F)	96.			
30	Compacted Thickness (In)	2.0			
31	Curing Period (Days)	00.0			

PREPARER Jane V. Duncan EMPLOYER BRE DATE 7-19-96

SPS-8 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS DENSITY AND PROFILE DATA	* STATE CODE [48] * SPS PROJECT CODE [8] * 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)	___.___	142.2	___.___
Maximum (pcf)	___.___	149.1	___.___
Minimum (pcf)	___.___	139.2	___.___
Standard Deviation (pcf)	___.___	___2.6	___.___
Layer Number	___ ___	___5	___ ___

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

2. MANUFACTURER OF NUCLEAR DENSITY GAUGE: TROXLER

3. NUCLEAR DENSITY GAUGE MODEL NUMBER: 3430

4. NUCLEAR DENSITY GAUGE IDENTIFICATION NUMBER: 17737

5. NUCLEAR GAUGE COUNT RATE FOR STANDARDIZATION: 3053
MOIST COUNT (564)

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) ___

SIGNATURE James S. Dill DATE 10/7/96

SPS-8 CONSTRUCTION DATA
SHEET 12
LAYER THICKNESS MEASUREMENTS

* STATE CODE [48]
* SPS PROJECT CODE [8]
* 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	8.0	—	4.6	—
	3	8.0	—	4.6	—
	6	7.9	—	4.7	—
	9	7.3	—	5.2	—
	12	7.3	—	5.5	—
0+50	0	8.9	—	4.6	—
	3	8.9	—	4.4	—
	6	9.0	—	4.6	—
	9	8.9	—	4.8	—
	12	8.6	—	5.4	—
1+00	0	8.4	—	4.9	—
	3	8.8	—	4.7	—
	6	8.6	—	4.7	—
	9	8.4	—	4.9	—
	12	8.0	—	5.4	—
1+50	0	7.2	—	5.2	—
	3	7.4	—	5.0	—
	6	7.7	—	5.0	—
	9	7.7	—	5.0	—
	12	7.6	—	5.5	—
2+00	0	8.8	—	5.2	—
	3	8.9	—	4.8	—
	6	9.0	—	4.6	—
	9	9.0	—	4.4	—
	12	8.5	—	5.3	—
2+50	0	9.6	—	5.4	—
	3	9.8	—	4.9	—
	6	10.1	—	4.8	—
	9	9.7	—	5.0	—
	12	9.5	—	5.5	—
3+00	0	8.9	—	4.9	—
	3	8.9	—	4.7	—
	6	8.6	—	4.8	—
	9	8.3	—	4.9	—
	12	7.8	—	5.5	—
LAYER NUMBER		3	—	5	—

SPS-8 CONSTRUCTION DATA SHEET 12 LAYER THICKNESS MEASUREMENTS	* STATE CODE [48] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

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	8.9	— — . —	4.0	— — . —
	3	8.9	— — . —	3.6	— — . —
	6	8.3	— — . —	4.1	— — . —
	9	7.8	— — . —	4.6	— — . —
	12	7.4	— — . —	5.2	— — . —
4+00	0	9.5	— — . —	4.2	— — . —
	3	9.5	— — . —	4.1	— — . —
	6	9.5	— — . —	4.1	— — . —
	9	8.9	— — . —	4.4	— — . —
	12	8.4	— — . —	5.0	— — . —
4+50	0	9.8	— — . —	4.8	— — . —
	3	9.8	— — . —	4.4	— — . —
	6	9.2	— — . —	5.0	— — . —
	9	8.6	— — . —	5.4	— — . —
	12	8.5	— — . —	5.5	— — . —
5+00	0	8.2	— — . —	5.3	— — . —
	3	7.9	— — . —	5.2	— — . —
	6	7.7	— — . —	5.3	— — . —
	9	7.3	— — . —	5.5	— — . —
	12	7.1	— — . —	6.0	— — . —
—+— —	— — —	— — . —	— — . —	— — . —	— — . —
	— — —	— — . —	— — . —	— — . —	— — . —
	— — —	— — . —	— — . —	— — . —	— — . —
	— — —	— — . —	— — . —	— — . —	— — . —
	— — —	— — . —	— — . —	— — . —	— — . —
—+— —	LANE	8.5	— — . —	4.9	— — . —
	1	7.1	— — . —	3.6	— — . —
	MAY	10.1	— — . —	6.0	— — . —
	STD	10.8	— — . —	10.5	— — . —
	— — —	— — . —	— — . —	— — . —	— — . —
—+— —	— — —	— — . —	— — . —	— — . —	— — . —
	— — —	— — . —	— — . —	— — . —	— — . —
	— — —	— — . —	— — . —	— — . —	— — . —
	— — —	— — . —	— — . —	— — . —	— — . —
	— — —	— — . —	— — . —	— — . —	— — . —
LAYER NUMBER		3	— —	5	— —

PREPARER _____ EMPLOYER _____ DATE 10/7/96

SPS-8 CONSTRUCTION DATA SHEET 13 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [48] * SPS PROJECT CODE [8] * TEST SECTION NO. [01]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [04-05-96]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [04-11-96]

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

PRIMARY COMPACTION EQUIPMENT

*4. CODE TYPE [3]

COMPACTION TYPE CODES
Pneumatic - Tired... 1 Steel Wheel Tandem... 2 Single Drum Vibr.... 3
Double Drum Vibr.... 4
Other (Specify)... 5 _____

*5. GROSS WEIGHT (TONS) [__ __.__]

*6. LIFT THICKNESSES

Nominal First Lift Placement Thickness (inches)	04/06/96	[4]
Nominal Second Lift Placement Thickness (inches)	04/11/96	[4]
Nominal Third Lift Placement Thickness (inches)		[__ __]
Nominal Fourth Lift Placement Thickness (inches)		[__ __]

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

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

SPS-8 CONSTRUCTION DATA SHEET 14 SUBGRADE PREPARATION	* STATE CODE [48] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [03-07-96]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [03-15-96]

PRIMARY COMPACTION EQUIPMENT

INITIAL MIXING W/ LIME THURSDAY 3/7/96
FINAL MIXING W/ LIME WEDNESDAY 3/13/96
COMPACTION FRIDAY 3/15/96

*3. CODE TYPE [3]

COMPACTION EQUIPMENT TYPE CODES
Sheepsfoot... 1 Pneumatic Tired... 2 Steel Wheel Tandem... 3
Single Drum Vibr.... 4 Double Drum Vibr.... 5
Other (Specify)... 6 _____

*4. GROSS WEIGHT (TONS) [__ __.__]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[2]	[10.0]
*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.) _____

APPENDIX E

PHOTOGRAPHS

Photo 1. Subgrade Preparation, 18 April 1996

Photo 2. Dense Graded Aggregate Base (DGAB), 6 June 1996

Photo 3. Laydown of Type B Binder Course, 16 July 1996

Photo 4. Compaction of Binder Course, 16 July 1996

Photo 5. Laydown of Type D Surface, 17 July 1996

Photo 6. Compaction of Binder Course, 17 July 1996

Photo 7. Drum Mix Plant, Young Brothers, College Station, TX

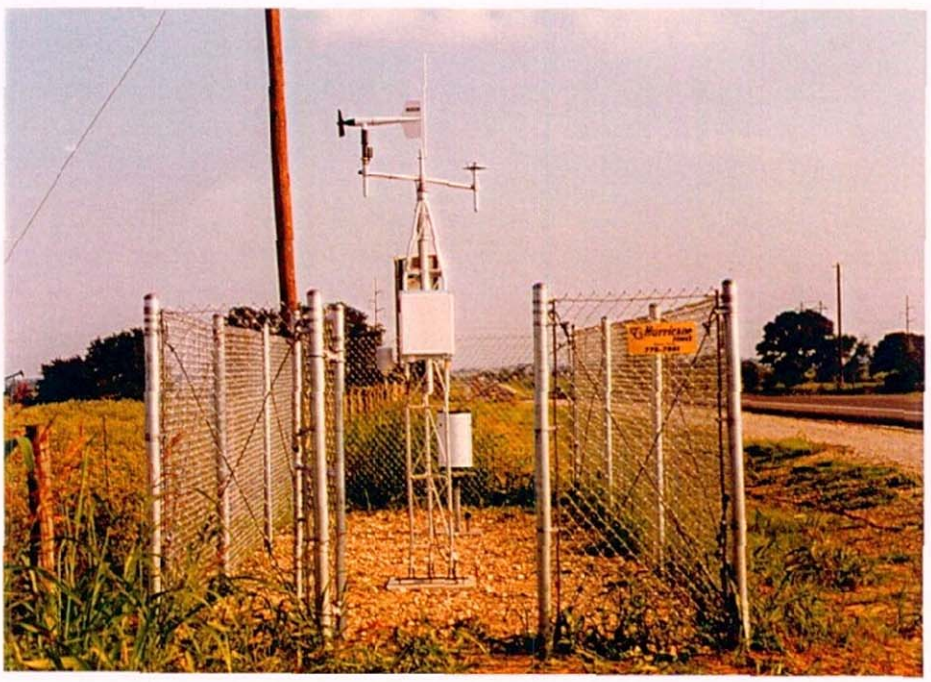


Photo 8. Automated Weather Station (AWS)