Compiled By

MISSOURI HIGHWAY AND TRANSPORTATION DEPARTMENT
DIVISION OF MATERIALS AND RESEARCH
RESEARCH SECTION
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Revised to Include Additional Test Sections By

MISSOURI DEPARTMENT OF TRANSPORTATION
RESEARCH, DEVELOPMENT AND TECHNOLOGY DIVISION
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Revised September 1990
Revised January 1993
Revised September 1998
INTRODUCTION TO SHRP

The Strategic Highway Research Program is a highly focused, five year, $150 million research program, funded under the Surface Transportation and Uniform Relocation Assistance Act of 1987. SHRP is supported through a mutual agreement among the Federal Highway Administration, the American Association of State Highway and Transportation Officials, and the National Research Council, and administered as an independent unit of the National Research Council. The program provided contracts for applied research providing timely solutions for specific operational problems facing highway officials and practitioners.

SHRP's program covers the following four technical areas: ASPHALT (A); CONCRETE AND STRUCTURES (C); HIGHWAY OPERATIONS (H); LONG TERM PAVEMENT PERFORMANCE (P). ¹

June 30, 1992 was the end of SHRP's fifth full fiscal year of operation. Effective June 30, 1992, the Long Term Pavement Performance (LTPP) was transferred to the FHWA. SHRP's other three program areas will close on March 30, 1993, with program wide implementation transferring to AASHTO, TRB and FHWA on that date. Congress authorized FHWA to spend $108 million over the next six years for continuation of LTPP and for SHRP implementation activities under the 1991 Intermodal Surface Transportation Efficiency Act.

This booklet outlines the 20 Missouri sites in the LTPP Study and 6 Missouri sites for Special Pavement Studies which are a part of the technical area.

¹ "Third Annual Work Program FY 1990", National Research Council, Strategic Highway Research Program, Washington, DC
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<td>Route 8</td>
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**GLOSSARY**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>AADT</td>
<td>Annual Average Daily Traffic</td>
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<tr>
<td>AC</td>
<td>Asphaltic Concrete</td>
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<tr>
<td>CRCP</td>
<td>Continuous Reinforced Concrete Pavement</td>
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<tr>
<td>C.T.A.B.</td>
<td>Cement Treated Aggregate Base</td>
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<td>GPS</td>
<td>General Pavement Study</td>
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<tr>
<td>JPCP</td>
<td>Jointed Plain Concrete Pavement</td>
</tr>
<tr>
<td>KESALS</td>
<td>One Thousand Eighteen-Kip Equivalent Single Axle Loads Per Year Per Lane</td>
</tr>
<tr>
<td>LTPP</td>
<td>Long Term Pavement Performance</td>
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<tr>
<td>O.G.B.B.</td>
<td>Open Graded Bituminous Base</td>
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<tr>
<td>PCC</td>
<td>Portland Cement Concrete</td>
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<tr>
<td>RPCCP</td>
<td>Reinforced Portland Cement Concrete Pavement</td>
</tr>
<tr>
<td>S.C.</td>
<td>Seal Coat</td>
</tr>
<tr>
<td>SHRP</td>
<td>Strategic Highway Research Program</td>
</tr>
<tr>
<td>SPS</td>
<td>Specific Pavement Study</td>
</tr>
<tr>
<td>S.S.B.</td>
<td>Sand Soil Base</td>
</tr>
<tr>
<td>S.S.C.T.B.</td>
<td>Sand Soil Cement Treated Base</td>
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</table>
INTRODUCTION TO LONG TERM PAVEMENT PERFORMANCE

Goal and Objectives

The objective for LTPP studies established by the "Strategic Highway Research Program" and adopted by the Advisory Committee for Pavement Performance as their goal was:

"To increase pavement life by investigation of various designs of pavement structures and rehabilitated pavement structures, using different materials and under different loads, environments, subgrade soil, and maintenance practices."

The specific objectives developed by the Advisory Committee are:

Evaluate existing design methods

Develop improved design methodologies and strategies for the rehabilitation of existing pavements

Develop improved design equations for new and reconstructed pavements

Determine the effects of (1) loading, (2) environment, (3) material properties and variability, (4) construction quality, and (5) maintenance levels on pavement distress and performance.

Determine the effects of specific design features on pavement performance.

Establish a national long-term pavement data base to support SHRP objectives and future needs

It is expected that accomplishment of these objectives will resolve most of the difficulties currently experienced in implementing successful pavement management systems.

All states were asked to "be involved" in the Long Term Pavement Performance Studies. Missouri is interested in "General Pavement Studies (GPS)", i.e., in service pavements, and "Specific Pavement Studies (SPS)".

General pavement studies (GPS) include nine separate experiments which are:

1. Asphaltic concrete on granular base
3. Jointed Plain Concrete Pavement - JPCP
4. Jointed Reinforced Concrete Pavement - JRCP
5. Continuously Reinforced Concrete Pavement - CRCP
6A. Existing asphalt concrete overlay of asphalt concrete pavement
6B. Planned asphalt concrete overlay of asphalt concrete pavement
7A. Existing asphaltic concrete overlay of portland cement concrete pavement
7B. Planned asphaltic concrete overlay of portland cement concrete pavement
8. Project deleted (Bonded PCC Overlay of PCC Pavement)
9. Unbonded portland cement concrete overlay of portland cement concrete pavement

Missouri submitted 69 candidate projects based on type of soil (coarse or fine subgrade), type of design or rehabilitation, traffic (ADT 2500 or greater), length (minimum of 1500 feet with no steep grades or curves, no culverts or drains), design thickness, no added lanes, and original date of construction (1965 or later for rigid pavement and 1970 for flexible pavements or rehabilitated pavements). In addition, the projects were selected geographically and included projects in 44 counties. It was anticipated that when selected, Missouri would have from 5 to 15 projects.

Specific Pavement Studies will be pavements to be built or rehabs with a study for various items such as effects of preventive maintenance, load equivalence factors, effects of subsurface drainage, environmental distress and hot or cold recycling.

The nine (9) Specific Pavement Studies (SPS) are as follows:

1. Flexible Pavement Structural Parameters
2. Rigid Pavement Structural Parameters
3. Flexible Pavement Preventive Maintenance Treatments
4. Rigid Pavement Preventive Maintenance Treatments
5. Rehabilitation of Asphalitic Concrete Pavements
6. Rehabilitation of Jointed Portland Cement Concrete Pavements
7. Bonded Portland Cement Concrete Overlay of Portland Cement Concrete Pavements

8. Environmental Effects on Flexible and Rigid Pavements

9. Field Verification of Asphalt Research

The following is an overview of the 20 projects located in the state that were selected by SHRP for General Pavement Studies. Also included are the Specific Pavement Studies that the department has elected to participate in to date.
MISSOURI
SHRP LONG TERM
PAVEMENT PERFORMANCE
TEST SECTIONS

GPS = GENERAL PAVEMENT STUDIES
SPS = SPECIFIC PAVEMENT STUDIES
Notes:
- Blue Background
- White letters
- White Border, 1" wide
- 1/2" offset from edge
- Letters and numbers
- 4" high
- SHRP logo 6" by 9"

Sign A Detail

Notes:
- Blue Background
- White Letters
- White Border 1/2" wide
- 1/2" offset from edge
- Letters and numbers
- 1 1/2" high

Sign B Detail
White paint stripe. 250' past end of Monitoring Site

Delineator located at end of Monitoring Site with 2 blue reflectors

Delineator located at beginning of Monitoring Site with 3 blue reflectors

Sign A located 500' in advance of Test Section

Spike or nail

General Layout of test section showing sign locations
NOT TO SCALE

WHITE PAINT STRIPE 4" WIDE MIN.
SPIKE or NAIL (1 ft from edge of travel lane)

PAINT CROSS (Maximum 12" by 12" with lines 4" wide)

500' MONITORING SITE

WHITE PAINT STRIPE 4" WIDE MIN.
SPIKE or NAIL (1 ft from edge of travel lane)

Details of monitoring site paint configuration
This site is located 0.3 mile east of Route D in the westbound lane, log mile 6.52. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500’ control section. The pavement was constructed in April 1986 under Project No. RS-RSEGC-169(2). AADT (1985) = 1960. KESALS (1985) = 19.

A Specific Pavement Study No. 3 (SPS-3) which is entitled "Flexible Pavement Preventive Maintenance Treatments" is located near this site. Details are on page 33.
This site is located 4.8 miles west of Route 52 west in the westbound lane, log mile 6.44. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the sites. A solid white line traverses the pavement with the SHRP ID NO. on the edge of pavement at the beginning of the 500' control section. The pavement was constructed in 1974 under Project No. F-54-3(26). AADT (1985) = 7170. KESALS (1988) = 80.

A Specific Pavement Study No. 3 (SPS-3) which is entitled "Flexible Pavement Preventive Maintenance Treatments" is located near this site. Details are on page 30.
This site is located 0.8 mile south of Route KK in the southbound lane, log mile 7.36. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1986 under Project No. BRF-171-1(4). AADT (1985) = 3770. KESALS (1985) = 52.
This site is location 0.3 mile west of Route H and 2.65 miles east of Route 17 in the eastbound lane, log mile 14.10. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1980 under Project No. I-44-2(84). AADT (1985) = 15432. KESALS (1985) = 319.
This site is located 1.0 miles south of the Opossum Creek Bridge in the southbound lane, log mile 3.5. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1983 under Project No. F-71-2(35). AADT (1985) = 8023. KESALS (1985) = 327.

This site was in the northbound lane. In August 1990, this section of the roadway became the southbound lane as a new northbound lane was completed.

SITE ABANDONED 8/90.
This site is located 1.0 miles south of the Opossum Creek Bridge in the southbound lane, log mile 3.5. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1983 under Project No. F-71-2(35). AADT (1985) = 8023. KESALS (1985) = 327.

This pavement was initially utilized as the northbound lane. In August 1990, this section of the roadway became the southbound lane as a new northbound lane was completed. This section was established adjacent to the deleted Section No. 294031, shown on page 12.

A Specific Study No. 4 (SPS-4) which is entitled "Rigid Pavement Preventative Maintenance Treatments" is located near this site. Details are on page 38.
This site is located 0.15 north of 108th Street Bridge and 0.85 mile south of Route 291 in the northbound lane, log mile 6.38. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section.
This site is located 0.5 mile south of Route 169 South Junction and 0.4 mile north of Missouri River Bridge in the southbound lane, log mile 2.55. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID No. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1974 under Project No. I-635-1(98)5. AADT (1985) = 35100. KESALS (1985) = 447.

This site was rehabilitated in 1991 by Project F.A.-635-1(247) which shifted this site from the GPS-4 cell to the GPS-7B cell.
This site is located 0.9 mile north of Route 69 in the northbound lane, log mile 13.22. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1977 under Project No. I-35-2(35)68. AADT (1985) = 8380. KESALS (1985) = 355.

A Specific Study No. 4 (SPS-4) which is entitled "Rigid Pavement Preventive Maintenance Treatments" is located near this site. Details are on page 36.

This site is located within a test section created as part of a study numbered MCHRP 78-1, Research Investigation No. 77-2. Layout details of this study are shown on page 17.
### Layout and Description of Test Sections

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<td>645.11.5</td>
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<tr>
<td>2&quot; Aggr.*  W/O Poly 4&quot; Type 3 Base</td>
<td>3/4&quot; Local Aggr. W Poly 4&quot; Type 3 Base</td>
<td>3/4&quot; Local Aggr. W/O Poly 4&quot; Type 3 Base</td>
<td>1&quot; Local Aggr. W/O Poly 4&quot; Type 3 Base</td>
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**Note:**
- *Aggregate with no known history of "D" Cracking (Burlington Limestone)*
- **Open graded aggregate base.
- T = Transition Slab

**Legend:**
- SPS-4 Site Starts 736+40

**Note:** Stationing shown is for centerline of northbound lane.
This site is located 0.8 mile west of R.R. Bridge in the eastbound lane, log mile 4.69. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section.
This site is located 1.1 miles north of Route 69 in the northbound lane, log mile 13.02. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1977 under Project No. I-35-2(35)68. AADT (1985) = 8380. KEALS (1985) = 355.

This site is located within a test section created as part of a study numbered MCHRP 78-1, Research Investigation No. 77-2. Layout details of this study are shown on page 17.
This site is located 1.3 miles north of Route 69 in the northbound lane, log mile 12.82. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1977 under Project No. I-35-2(35)68. AADT (1985) = 8380. KESALS (1985) = 355.

This site is located within a test section created as part of a study numbered MCHRP 78-1. Research Investigation No. 77-2. Layout details of this study are shown on page 17.
This site is located 1.5 miles north of Route 69 in the northbound lane, log mile 12.62. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1977 under Project No. I-35-2(35)68. AADT (1985) = 8380. KESALS (1985) = 355.

This site is located within a test section created as part of a study numbered MCHRP 78-1, Research Investigation No. 77-2. Layout details of this study are shown on page 17.
This site is located 0.1 mile north of Route Y in the northbound lane, log mile 3.94. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1957 under Project No. 79-F-299(5). AADT (1987) = 8500. KESALS (1987) = 50.

This site was rehabilitated by Project No. 6-P-884 in 1990.
This site is located 0.2 mile north of Route C in the northbound lane, log mile 11.90. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID No. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1967 under Project No. C035-25(4). This site was rehabilitated by Project No. F-25-1(24) in 1989. AADT (1985) = 3100. KESALS (1985) = 90.
This site is located 1.05 miles north of Route CC in the northbound lane, log mile 19.39. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1965 under Project No. F-25-1(5). This site was rehabilitated by Project No. F-25-1(23), Sec. B. in 1989. AADT (1987) = 5200. KESAL (1987) = 125.
This site is located 2.2 miles east of Route 87 in the westbound lane, log mile 21.88. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1960 under Project No. 1-IG-70-3(25)105. AADT (1987) = 9200. KESALS = 400.

This site was rehabilitated by Project No. IR-70-3(140). Project was started in 1989 and finished in 1990. Samples by SHRP contractor taken after Type I-B mixture was placed.
This site is located 3.6 miles east of end of divided pavement in the westbound lane, log mile 7.55. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1973 under Project No. 210-SU-SUG-7-647(7). AADT (1987) = 8700. KESALS (1987) = 205.

This site was rehabilitated by Project No. F.A. 3315(401) in 1991.
This site is located 2.92 miles west of Route B in the eastbound lane, log mile 37.61. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID No. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1965 under Project No. Sec. 18(2). Overlaid in 1981 under Project No. I-PMS-60-3(40). AADT (1985) = 2840. KESALS (1985) = 55.
This site is located 0.25 mile west of weigh station and 0.45 mile east of rest area exit in eastbound lane, log mile .58. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1957 under Project No. IN-FI-432(3). Overlaid in 1972 under Project No. I-FI-44-1(36). AADT (1985) = 11900. KESALS (1985) = 336.

This site is scheduled for rehabilitation in 1993.
This site is located 0.5 mile south of Route 36 in the northbound lane, log mile 12.84. A blue sign with the SHRP Logo and the SHRP ID No., facing traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1965 under Project No. Sec. 59(2). Overlaid in 1981 under Project No. FR-PMS-65-4(17). AADT (1986) = 3120. KESAIS (1986) = 90.
The test section sites are located between 4.6 and 5.8 miles west of Route 52 west, in the westbound lane, log mile 6.64 to 7.84. Blue signs with the SHRP Logo, SPS-3, Treatment, and Section Number, face traffic, and are used to locate the test sections. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' study sections. The pavement was constructed in 1974 under Project No. F-54-3(26). AADT (1985) = 7170. KESALS (1988) = 80.

There is a General Pavement Study site located near the SPS sites. It is Site Number 291005.
SPS-3A TEST SECTION LAYOUT
Route 54, Miller County

Westbound Lanes Only

TRAFFIC FLOW

29A340
Control
Section

GPS SECTION

29A310
Thin
Overlay

29A320
Slurry
Seal

29A330
Crack
Seal

29A350
Chip
Seal

29A351
Chip
Seal
(State)

Typical
AREA OF TREATMENT (500' plus minimum 100' transition zone each side)

Passing

Both
Lanes
Receive
Treatment

Driving

500'
Study Section
SPS-3A

TEST SITE CONSTRUCTION

The test sections:

29A320 - Slurry Seal
29A330 - Crack Seal
29A350 - Chip Seal

were built under a region contract by Delta Asphalt Paving, Inc., of Council Bluffs, Iowa. The reason for this was to have uniform construction techniques and materials for all the test sections in the North Central Region. The construction was inspected by the Federal Highway Administration, Central Federal Lands Highway Division.

Test Section 29A310, thin overlay, was constructed by Richardson & Bass Construction of Columbia, Missouri, and inspected by the Research Section.

Test Section 29A351, Chip Seal (State), was constructed by District 5 Maintenance and Traffic forces and inspected by the Research Section.

Semi-annual inspections of this test site will be conducted.
The test sections are located between 0.2 and 1.2 miles east of Route D in the eastbound lane, log mile 6.42 to 7.42. Blue signs with the SHRP Logo, SPS-3, Treatment and Section Number, face traffic, is used to locate the site. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' control section. The pavement was constructed in 1986 under Project No. RS-RSEG-169(2). AADT (1985) = 1960. KESALS (1985) = 19.

There is a General Pavement Study site located near the SPS sites. It is Site Number 291002.
SPS-3B TEST SECTION LAYOUT
Route C, Cole County

2 Way Traffic

Typical
AREA OF TREATMENT (500' plus minimum 100' transition zone each side)

Study Section
The test sections:

29B320 - Slurry Seal
29B330 - Crack Seal
29B350 - Chip Seal

were built under a region contract by Delta Asphalt Paving, Inc., of Council Bluffs, Iowa. The reason for this was to have uniform construction techniques and materials for all the test sections in the North Central Region. The construction was inspected by the Federal Highway Administration, Central Federal Lands Highway Division.

Test Section 29B310, thin overlay, was constructed by Richardson & Bass Construction of Columbia, Missouri, and inspected by the Research Section.

Test Section 29B351, Chip Seal (State), was constructed by District 5 Maintenance and Traffic forces and inspected by the Research Section.

Semi-annual inspections of this test site will be conducted.
The site is 1.7 miles north of Route 69 in the northbound lanes, log mile 11.32 to 10.62. Blue signs with the SHRP Logo, SPS-4, Treatment, and Section Number facing traffic are used to locate these sites. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' study sections. The pavement was constructed in 1977 under Project No. I-35-2(35)68. AADT (1985) = 8380. KESALS (1985) = 355.

There is a General Pavement Study site located near the SPS sites. It is Site Number 295000.

Test Sections 29A410, 29A411, and 29A430 were built by Maintenance and Traffic forces.
SPS-4A TEST SECTION LAYOUT
Route I-35, Daviess County

ONE WAY TRAFFIC
NORTH BOUND LANE

295000
GPS-4
TEST SECTION
ORIGINAL SEAL

29A430
CONTROL
SECTION
NO SEAL

29A410
SILICONE
FULL SEAL

29A411
HOT POUR
FULL SEAL
(STATE)

TYPICAL
AREA OF TREATMENT
(500' PLUS A SLAB LENGTH TRANSITION ZONE ON EACH END)

PASSING LANE

DRIVING LANE

500'
STUDY SECTION

BOTH LANES RECEIVE TREATMENT
This site is located 1.0 miles south of the Opossum Creek Bridge in the southbound lane, log mile 3.5 to 4.0. Blue signs with the SHRP Logo, SPS-4, Treatment, and Section Number facing traffic, are used to locate these sites. A solid white line traverses the pavement with the SHRP ID NO. on the edge of pavement at the beginning of the 500' study sections. The pavement was constructed in 1983 under Project No. F-71-2(35). AADT (1985) = 8023. KESALS (1985) = 327.

There is a General Pavement Study site located near the SPS sites. It is Site Number 295503.

Test Sections 29B410, 29B411, and 29B430 were built by Maintenance and Traffic forces.
### SPS-4B TEST SECTION LAYOUT

**Route 71, Jasper County**

**ONE WAY TRAFFIC**  
SOUTH BOUND LANE

| 29B430 CONTROL SECTION | 29B410 SILICONE FULL SEAL | 295503 GPS-4 TEST SECTION ORIGINAL SEAL | 29B411 HOT POUR FULL SEAL (STATE) |

**TYPICAL AREA OF TREATMENT**  
(500' PLUS A SLAB LENGTH TRANSITION ZONE ON EACH END)

```
<table>
<thead>
<tr>
<th>500'</th>
<th>500'</th>
</tr>
</thead>
<tbody>
<tr>
<td>500'</td>
<td>500'</td>
</tr>
<tr>
<td>500'</td>
<td>500'</td>
</tr>
<tr>
<td>500'</td>
<td>500'</td>
</tr>
</tbody>
</table>
```

**PASSING LANE**  
**DRIVING LANE**

**BOTH LANES RECEIVE TREATMENT**
This site is located in the northbound lane, from the Arkansas state line north 3.7 miles, log mile 23.387 to 19.673. Blue signs with the SHRP Logo and the SHRP ID No., facing traffic, are used to locate the test sections. A solid white line traverses the pavement with the SHRP ID No. on the edge of the pavement at the beginning of the 500' or 1000' study sections. The pavement was constructed in 1982 under Project No. 8-P-65-23B (earthwork) and 8-P-65-23C (paving).


The test sections were constructed in 1998 under Job No. J8P0666.

Original cross-section. See table page 41 for the rehabilitation completed.
<table>
<thead>
<tr>
<th>SHRP ID</th>
<th>Limits</th>
<th>General Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>290501</td>
<td>1037+50 to 1052+00</td>
<td>No Overlay, Control Section</td>
</tr>
<tr>
<td>290502</td>
<td>1052+00 to 1068+00</td>
<td>2&quot; Recycled I-C Overlay, Minimum Pavement Preparation</td>
</tr>
<tr>
<td>290503</td>
<td>1068+00 to 1095+00</td>
<td>5&quot; Recycled Overlay, (2&quot; Recycled I-C, 3&quot; Recycled I-B), Minimum Pavement Preparation</td>
</tr>
<tr>
<td>290508</td>
<td>1095+00 to 1105+00</td>
<td>7&quot; Recycled Overlay, (2&quot; Recycled I-C, 3&quot; Recycled I-B, 2&quot; Recycled I-B), Intensive Pavement Preparation (2&quot; Cold Milled)</td>
</tr>
<tr>
<td>290509</td>
<td>1105+00 to 1141+00</td>
<td>4&quot; Recycled Overlay, (2&quot; Recycled I-C, 2&quot; Recycled I-B), Intensive Pavement Preparation (2&quot; Cold Milled)</td>
</tr>
<tr>
<td></td>
<td>1141+00 to 1152+00</td>
<td>4&quot; Virgin Bituminous Mixture Overlay, (2&quot; Virgin I-C, 2&quot; Virgin I-B), Intensive Pavement Preparation (2&quot; Cold Milled)</td>
</tr>
<tr>
<td></td>
<td>(No Test Section in this area)</td>
<td></td>
</tr>
<tr>
<td>290507</td>
<td>1152+00 to 1165+00</td>
<td>7&quot; Virgin Bituminous Mixture Overlay, (2&quot; Virgin I-C, 3&quot; Virgin I-B, 2&quot; Virgin I-B), Intensive Pavement Preparation (2&quot; Cold Milled)</td>
</tr>
<tr>
<td>290506</td>
<td>1165+00 to 1194+00</td>
<td>4&quot; Virgin Bituminous Mixture Overlay, (2&quot; Virgin I-C, 2&quot; Virgin I-B), Intensive Pavement Preparation (2&quot; Cold Milled)</td>
</tr>
<tr>
<td>290504</td>
<td>1194+00 to 1223+50</td>
<td>5&quot; Virgin Bituminous Mixture Overlay, (2&quot; Virgin I-C, 3&quot; Virgin I-B), Minimum Pavement Preparation</td>
</tr>
<tr>
<td>290505</td>
<td>1223+50 to 1233+61.99</td>
<td>2&quot; Virgin I-C Overlay, Minimum Pavement Preparation</td>
</tr>
</tbody>
</table>
This site is location 0.2 miles south of Route 13 in the southbound lane, log mile 25.97 to 30.13. Blue signs with the SHRP Logo and the SHRP ID No., facing traffic, are used to locate the test sections. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' or 1000' study sections. The pavement was constructed in 1975 under Project No. I-35-2(37)B. AADT (1990) = 9771. KESALS (1990) = 426.

The test sections were constructed in 1992 under Job No. 11-507-35.

Original cross-section. See table page 43 for the rehabilitation completed.
### SPS-6 TEST SECTION LAYOUT
#### Route I-35, Harrison County

<table>
<thead>
<tr>
<th>TEST SECTION DETAILS AND TREATMENT OPTIONS</th>
<th>Required By SHRP</th>
<th>Additional By Missouri</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>Minimal</td>
</tr>
<tr>
<td>Section Number (2906_)</td>
<td>01</td>
<td>02</td>
</tr>
<tr>
<td>Section Length (100 ft.)</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Overlay Thickness (in.)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Joint Sealing</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Crack Sealing</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Partial Depth Patch</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Full Depth Patch/Joint Repair</td>
<td>N</td>
<td>X</td>
</tr>
<tr>
<td>Full Surface Diamond Grinding</td>
<td>N</td>
<td>X</td>
</tr>
<tr>
<td>Undersealing</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Subdrainage</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Saw and Seal</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Crack/Break and Seat</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Rubblized</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

- **X**  - Applied treatment as warranted.
- **R&R**  - Removed and replaced existing, and applied additional as warranted.
- **N**  - Did not perform.
- **B**  - Full depth dowelled patch.
- **A**  - Applied treatment regardless of condition or need.
This site is located east of Route 21 in the eastbound lane, log mile 19.35 to 27.923. Blue signs with the SHRP Logo and the SHRP ID No., facing traffic, are used to locate the test sections. A solid white line traverses the pavement with the SHRP ID No. on the edge of the pavement at the beginning of the 500' or 1000' study sections. The pavement was constructed in 1969 under Project No. C110-A(2) A&B. AADT (1996) = 7250. KESALS (1996) = 200.

The test sections were constructed in 1998 under Job No. J9P0479.

Original cross-section. See table pages 45-46 for the rehabilitation completed.
### SHRP ID | LIMITS | GENERAL DESCRIPTION
---|---|---
29A602 | 55+00 to 67+00 | 0" Asphalt Overlay  
Joint and Crack Sealing  
Full Depth Patching  
Diamond Grinding
29A601 | 73+00 to 80+00 | Control Section  
Joint and Crack Sealing
29A606 | 87+00 to 94+00 | 4" Asphalt Overlay  
(1 3/4" I-C, 2 1/4" I-B)  
Full Depth Patching  
Subdrainage  
Undersealing
29A604 | 94+00 to 101+00 | 4" Asphalt Overlay  
(1 3/4" I-C, 2 1/4" I-B)  
Full Depth Patching  
Saw and Seal Joints in Overlay
29A605 | 122+00 to 134+00 | 0" Asphalt Overlay  
R&R Joint and Crack Sealing  
Joint and Crack Sealing  
R&R Partial/Full Depth Patches  
Full Depth Patches  
Diamond Grinding  
Subdrainage  
Undersealing
<table>
<thead>
<tr>
<th>SHRP ID</th>
<th>LIMITS</th>
<th>GENERAL DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>29A608</td>
<td>286+50 to 293+50</td>
<td>8&quot; Asphalt Overlay</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1 3/4&quot; I-C, 3 1/4&quot; I-B, 3&quot; I-B)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crack/Break and Seat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subdrainage</td>
</tr>
<tr>
<td>29A607</td>
<td>297+50 to 304+50</td>
<td>4&quot; Asphalt Overlay</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1 3/4&quot; I-C, 2 1/4&quot; I-B)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crack/Break and Seat</td>
</tr>
<tr>
<td>29A603</td>
<td>304+50 to 316+50</td>
<td>4&quot; Asphalt Overlay</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1 3/4&quot; I-C, 2 1/4&quot; I-B)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Full Depth Patching</td>
</tr>
</tbody>
</table>
The test sections are located between Route JJ, St. Francois County to Route JJ, Jefferson County, in the northbound lane, log mile 54, St. Francois County, to 9.828, Jefferson County. Blue signs with the SHRP Logo and the SHRP ID No., facing traffic, are used to locate the test sections. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' study sections. The original pavement was constructed in 1955 under Project No. F-185(12) SEC. A and B.


Original cross-section. See page 48 for the rehabilitation completed.
## SPS-7 TEST SECTION LAYOUT

**Route 67, Jefferson County**

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Station to Station</th>
<th>Overlay Thickness</th>
<th>Surface Preparation</th>
<th>Grouted</th>
</tr>
</thead>
<tbody>
<tr>
<td>290701</td>
<td>1863+43 to 1857+43</td>
<td>0&quot;</td>
<td>Control Section</td>
<td>No Work</td>
</tr>
<tr>
<td>290702</td>
<td>1673+50 to 1668+50</td>
<td>3&quot;</td>
<td>Cold Milled</td>
<td>Yes</td>
</tr>
<tr>
<td>290703</td>
<td>1850+17 to 1845+17</td>
<td>3&quot;</td>
<td>Cold Milled</td>
<td>No</td>
</tr>
<tr>
<td>290704</td>
<td>1728+51 to 1723+51</td>
<td>3&quot;</td>
<td>Shotblasted</td>
<td>No</td>
</tr>
<tr>
<td>290705</td>
<td>1687+07 to 1682+07</td>
<td>3&quot;</td>
<td>Shotblasted</td>
<td>Yes</td>
</tr>
<tr>
<td>290706</td>
<td>1615+50 to 1610+50</td>
<td>5&quot;</td>
<td>Shotblasted</td>
<td>Yes</td>
</tr>
<tr>
<td>290707</td>
<td>1624+83 to 1619+53</td>
<td>5&quot;</td>
<td>Shotblasted</td>
<td>No</td>
</tr>
<tr>
<td>290708</td>
<td>1638+75 to 1633+75</td>
<td>5&quot;</td>
<td>Cold Milled</td>
<td>No</td>
</tr>
<tr>
<td>290709</td>
<td>1632+25 to 1627+25</td>
<td>5&quot;</td>
<td>Cold Milled</td>
<td>Yes</td>
</tr>
<tr>
<td>290710</td>
<td>1857+28 to 1852+28</td>
<td>3&quot;</td>
<td>Asphalt Overlay Section*</td>
<td></td>
</tr>
<tr>
<td>290711</td>
<td>1812+13 to 1807+13</td>
<td>4&quot;</td>
<td>Contractor Selected**</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*This section was added by the department to evaluate the 3" asphalt overlay to the concrete overlay.

**This section's surface was prepared as the contractor selected for the majority of the project, cold milled then shotblasted.
The test sections are located 2.5 miles south of Route F and 1.75 miles north of Route EE, on the west service road in the south bound lane, log mile 8.646 to 9.110. Blue signs with the SHRP Logo and the SHRP ID No., facing traffic, are used to locate the test sections. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' study sections. The test sections were constructed in 1998 under Project No. 8P0606.

STRATEGIC HIGHWAY RESEARCH PROGRAM
SPS-8
Long Term Pavement Performance Studies (LTPP)
Specific Pavement Studies (SPS)
ENVIRONMENTAL EFFECTS ON FLEXIBLE AND RIGID PAVEMENTS
West Outer Road of Route 65, Christian County

Typical Sections

See table page 51 for the test section layout.
## SPS-8 REVISED TEST SECTION LAYOUT
West Outer Road of Route 65, Christian County

<table>
<thead>
<tr>
<th>SHRP ID</th>
<th>Study Limits</th>
<th>General Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>290801</td>
<td>454+00 to 460+50</td>
<td>4&quot; AC Pavement (1 3/4&quot; Type I-C, 2 1/4&quot; PMBB) over 8&quot; Type 5 Agg. Base</td>
</tr>
<tr>
<td>290802</td>
<td>460+50 to 467+00</td>
<td>7&quot; AC Pavement (1 3/4&quot; Type I-C, 2 1/4&quot; PMBB, 3&quot; PMBB) over 12&quot; Type 5 Agg. Base</td>
</tr>
<tr>
<td>290808</td>
<td>467+00 to 474+00</td>
<td>11&quot; Non-Reinforced PCCP over 6&quot; Type 5 Agg. Base</td>
</tr>
<tr>
<td>290807</td>
<td>474+00 to 480+00</td>
<td>8&quot; Non-Reinforced PCCP over 6&quot; Type 5 Agg. Base</td>
</tr>
</tbody>
</table>
The test sections are located on the west service road in the north bound lane, 0.75 miles north of the end of the outer road and 500' south of the intersection of Route 61 and County Roads 93 and 94, near main line log mile 11.38 to 11.99. Blue signs with the SHRP Logo and the SHRP ID No., facing traffic, are used to locate the test sections. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 500' study sections. The test sections were constructed in 1998 under Project No. J3P0062.

$\text{AADT (1998) = 118. KESALS (1998) = 48 Flexible and 96.5 Rigid.}$
See table page 54 for the test section layout.
**SPS-8A TEST SECTION LAYOUT**  
West Outer Road of Route 61, Ralls County

<table>
<thead>
<tr>
<th>SHRP ID</th>
<th>Study Limits</th>
<th>General Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>29A801</td>
<td>177+00 to 184+00</td>
<td>4&quot; AC Pavement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1 3/4&quot; Type I-C, 2 1/4&quot; PMBB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>over 8&quot; Type 5 Agg. Base</td>
</tr>
<tr>
<td>29A802</td>
<td>185+00 to 192+00</td>
<td>7&quot; AC Pavement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1 3/4&quot; Type I-C, 2 1/4&quot; PMBB, 3&quot; PMBB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>over 12&quot; Type 5 Agg. Base</td>
</tr>
<tr>
<td>29A803</td>
<td>195+00 to 202+00</td>
<td>8&quot; Non-Reinforced PCCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>over 6&quot; Type 5 Agg. Base</td>
</tr>
<tr>
<td>29A804</td>
<td>202+00 to 209+00</td>
<td>11&quot; Non-Reinforced PCCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>over 6&quot; Type 5 Agg. Base</td>
</tr>
</tbody>
</table>
This site is located in the southbound lane beginning at the Route D & J intersection, log mile 5.2 to 10.2. Blue signs with the SHRP Logo and the SHRP ID No., facing traffic, are used to locate the test sections. A solid white line traverses the pavement with the SHRP ID NO. on the edge of the pavement at the beginning of the 1000' study sections. The original pavement was constructed under two contracts. One portion from Sta 277+00 to (374+31.2 Back = 410+00 Ahead) was built in 1968 under Project No. F-65-3(1). The second portion Sta 410+00 to 579+50 was built in 1966 under contract F-65-3(16).


The test sections were constructed in 1996 under Job No. J5U0725.

Original cross-section. See table page 56 for the rehabilitation completed.
<table>
<thead>
<tr>
<th>SHRP ID &amp; Test Section Number</th>
<th>Mix Placement Limits/Study Limits</th>
<th>General Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>290959</td>
<td>277+00 to 301+44/289+44 to 299+44/291+94 to 296+94</td>
<td>2 inches of Stone Mastic Asphalt (SMA) with fibers, over 2 inches of MHTD I-B Mix, both with AC-20. (2,444 L.F.)</td>
</tr>
<tr>
<td>290960</td>
<td>301+44 to 327+90/315+90 to 325+90/318+40 to 323+40</td>
<td>2 inches of Stone Mastic Asphalt (SMA) with fibers and PG 64-28, over 2 inches of MHTD I-B Mix with AC-20. (2,646 L.F.)</td>
</tr>
<tr>
<td>290961</td>
<td>327+90 to 357+41/345+41 to 355+41/347+91 to 352+91</td>
<td>SUPERPAVÉ Mix Design, 2 inches of SP125, over 2 inches of MHTD I-B Mix, both with AC-20. (2,951 L.F.)</td>
</tr>
<tr>
<td>290901</td>
<td>357+41 to 447+46/435+46 to 445+46/438+06 to 443+06</td>
<td>Highway Agency Standard Mix, 2 inches of I-C Mix, over 2 inches of I-B Mix, both with AC-20. (5,438 L.F.)</td>
</tr>
<tr>
<td>290903</td>
<td>447+46 to 469+63/457+63 to 467+63/460+13 to 465+13</td>
<td>SUPERPAVÉ Mix Design, (Alternate Binder Mix), 2 inches of SP125 with PG 58-28, over 2 inches of SP190 with PG 64-28. (To examine rutting) (2,217 L.F.)</td>
</tr>
</tbody>
</table>
SUPERPAVE Mix Design, 2 inches of SP125 with PG 64-28, over 1.5 inches of SP190 with PG 64-28. (2,454 L.F.)

SUPERPAVE Mix Design, 2 inches of SP125 with PG 64-28, over 2 inches of SP190 with PG 64-28. (3,970 L.F.)

SUPERPAVE Mix Design, 2 inches of SP125 with PG 70-28, over 2 inches of SP190 with PG 64-28. (To examine rutting) (2,635 L.F.)

SUPERPAVE Mix Design, 2 inches of SP125 with PG 64-16, over 2 inches of SP190 with PG 64-28 binder. (To examine thermal cracking) (1,919 L.F.)