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June 13, 1996

Mr. Richard Ingberg, P.E., Regional Engineer  
FHWA LTPP  
c/o Braun Intertec, Inc.  
6875 Washington Avenue South  
P.O. Box 39108  
Minneapolis, MN 55439

Re: Illinois SPS-6 Construction Report  
FHWA-LTPP  
SME Project No. PP18400

Dear Mr. Ingberg:

Enclosed please find three copies of the construction report for the Illinois SPS-6 project.

Should you have any questions concerning this report, please contact our office.

Very truly yours,

**SOIL AND MATERIALS ENGINEERS, INC.**

Cary T. Keller, P.E.  
Senior Engineer

Enclosure: Construction Report: Illinois SPS-6 (3 copies)

pc: Erland Lukanen, Braun Intertec  
*Monte* **Monte Symons, FHWA-LTPP**  
Eric Harm, Illinois Dept. of Transportation



FEDERAL HIGHWAY ADMINISTRATION  
Long Term Pavement Performance  
Specific Pavement Studies

CONSTRUCTION REPORT FOR SPS-6  
170600

Illinois Department of Transportation  
Illinois Control Section: FR09101  
Illinois Job Number: 28164A

IH-57 Northbound, Champaign County  
Illinois

Report Prepared by:  
Soil and Materials Engineers, Inc.  
FHWA-LTPP North Central Region  
December 1995



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## 1.0 INTRODUCTION

The SPS-6 experiment was designed to investigate the performance of selected rehabilitation techniques for jointed Portland Cement Concrete (PCC) pavements. These include a combination of levels and types of pavement preparation with or without the application of asphalt concrete (AC) overlays. The Illinois DOT SPS-6 project involved the rehabilitation of a jointed reinforced portland cement concrete (JRCP) pavement that was in fair condition. The project lies in the Wet-Freeze environmental area and consists of nine (9) test sections that incorporate routine maintenance sections with no overlay, minimum surface preparation sections, intensive surface preparation sections, and crack and seat sections. In addition to the main experiment there were five supplemental sections that encompassed pavement milling and diamond grinding, reflective crack reduction using a geotextile and rubblization with overlays.

The project is located on the northbound outside lane of Interstate 57 in Champaign County and is situated 13.5 miles south of Champaign, Illinois. Figure 1 shows the general site location. The road was constructed in 1964 and opened to traffic in 1965, and comprises a four lane divided highway with 12 ft driving lanes and 10 ft asphalt concrete shoulders. Traffic volumes reported in the construction documents for the year 1989 were as follows:

**Table 1 Traffic Data**

Annual Average Daily Traffic (Two Direction)	14,150
Percent heavy trucks and Combination (of AADT)	21%
Count year of AADT Estimate	1987
Traffic growth rate since project opened to traffic (%/yr)	8.80
18K ESAL rate in proposed study lane (1,000 ESAL/YR)	622
Year of ESAL rate estimate	1987
Estimated Total 18K ESAL application in study lane	9,500,000

The existing pavement section consisted of 10 inches of JRCP with 100 ft contraction joint spacing. The PCC was reported to have a Flexural Strength of 830 psi and the subgrade a Modulus of Subgrade Reaction of 100 pci. This was placed on 6 inches of crushed stone over silty clay embankment fill which averaged about 14 ft thick. The predominate distresses observed in the pavement were transverse cracking, faulting at the joints and joint seal damage. At the time of the pre-construction survey, the pavement condition was assessed to be in fair condition.

The experimental test sections are located on a portion of Interstate 57 that has no horizontal curves and minimum change in elevation. Appendix B contains the plan and profile sheets within the limits of the experiment.

Site specific traffic data is collected by a GK Instruments AWACS 6000 Piezoelectric Weight Sensor, Inductive Loop, and Off-Scale Detector. The equipment was installed in all four lanes in the late summer of 1991.

An automatic weather station was not installed at the site. It will be necessary to rely upon information from the Urbana observatory located about 15 miles north of the site.

The project including the SPS-6 was advertised for bids in the winter of 1990 using IL Standard Specification for Road Construction. The contract ACIR-57-5(170)220 was awarded



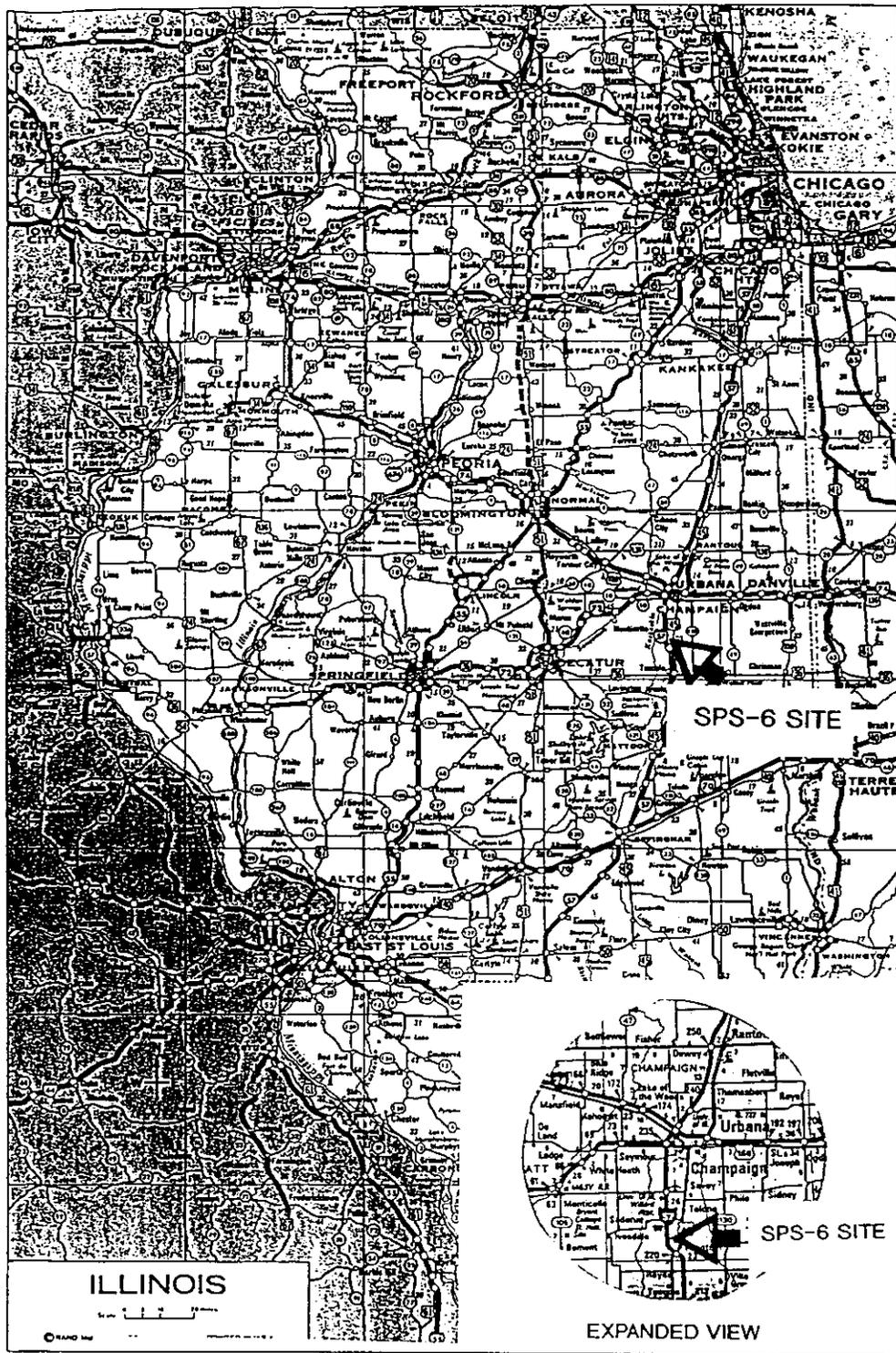


FIG. 1 SPS-6 SITE LOCATION



in Spring, 1990, with a start date of April 1990. The project was completed in November, 1990.

The following is a list of personnel from the state who were involved in the project development.

Mr Eric Harm  
Ms Christine Reed  
Bureau of Material and Physical Research  
126 East Ash Street  
Springfield, Illinois 62704-4766

Ron Smith, Resident Engineer  
Rt 133 West  
P O Box 610  
Paris, IL 61944

The prime contractor and subcontractors were

University Asphalt, Prime Contractor - Patching, asphalt concrete paving, base preparation, crack and seal  
2906 N Oak St  
P O Box 848  
Urbana, IL 61801

Central Illinois Tile, Subcontractor - Underdrains

Gallager Co, Subcontractor - PCC pavement milling

Opperman Co, Subcontractor - Diamond Grinding

Asphalt Improvements, Inc, Subcontractor - Joint or crack routing and filling

North Central Region LTPP personnel who worked on the project were Chuck Gemayel, Starr Kohn, Michael Marti, and Gene Skok. Richard Ingberg was the Regional Engineer.

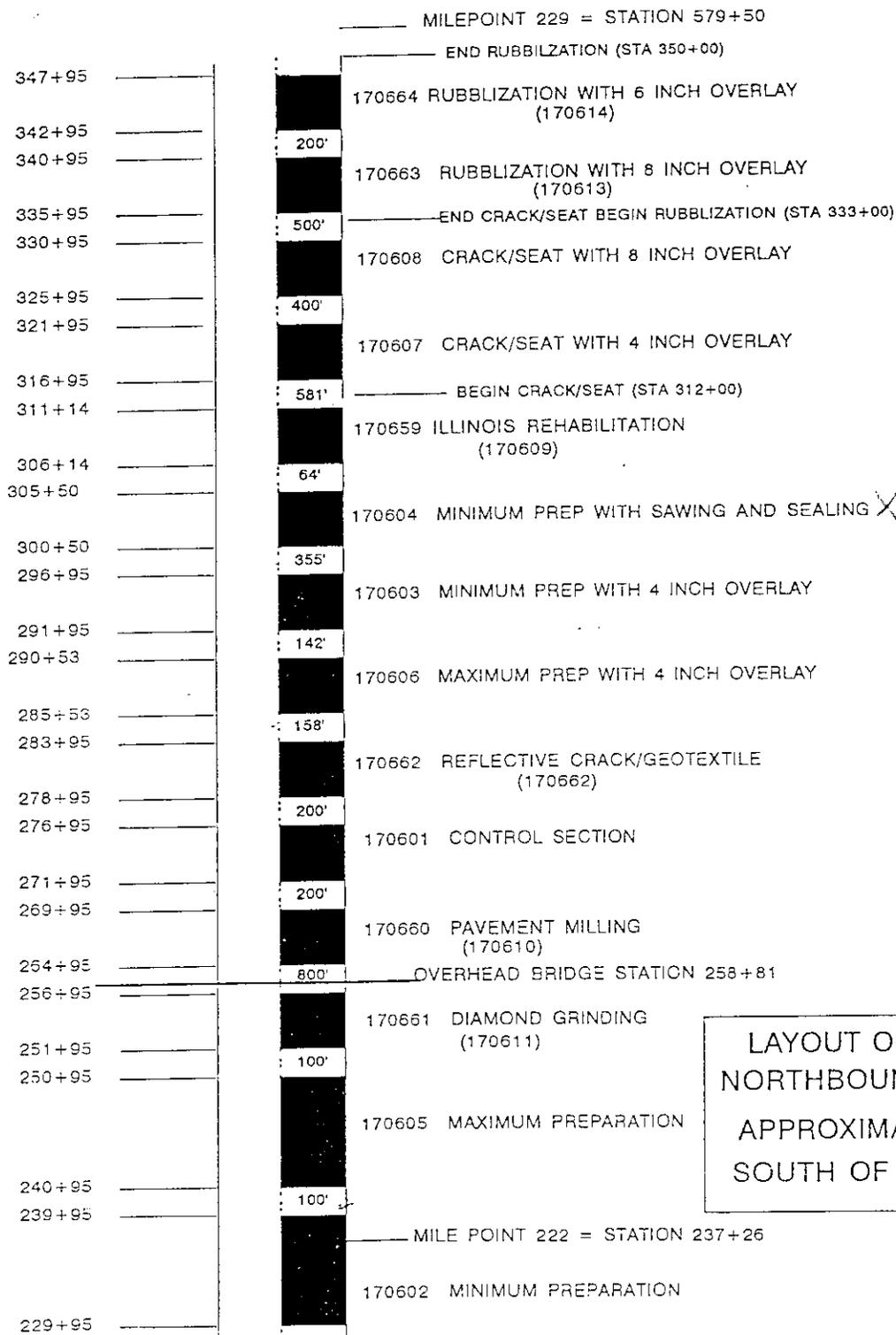
### 1.1 Deviations

Appendix A contains the SPS Project Deviation Report Summary Sheet for this project. The following items are known deviations from the SPS-6 Guidelines.

#### Site Location Deviations:

There were no site location deviations for the core test sections and agency typical section.





LAYOUT OF SPS-6 ON I-57  
 NORTHBOUND DRIVING LANE  
 APPROXIMATELY 13.5 MILES  
 SOUTH OF CHAMPAIGN, ILL.

JANUARY 19, 1994

FIGURE 2 TEST SECTION LAYOUT



### Construction Deviations

Sections 170603 and 170604 were joint and crack sealed prior to being overlaid

The overlays on sections 170603, 170606, 170607, and 170608 were constructed below the minimum thickness tolerance of 1/4 inch for the 4 inch overlays and 1/2 inch for the 8 inch overlay section based on the results of cores taken after construction. However, the elevation measurements taken at the site indicated that in general the required thickness was met

## 2.0 PROJECT DETAILS

### 2.1 Layout

The site layout for the Illinois SPS-6 experiment is shown in Figure 2. Sections with no overlay were located to the south end of the site. Crack and seat and rubblized sections with 8 inch overlay were located at the north. Beginning and ending stations shown indicate the lengths of each test section and transition sections.

### 2.2 Test Section Properties

Each section was provided with different levels of surface preparation/rehabilitation. Table 2 summarizes the work performed for each section in the core experiment and the agency supplemental and auxiliary test sections. The Illinois "Standard Specifications for Road and Bridge Construction, Adopted July, 1, 1988" were used for the project in conjunction with special provisions in effect at the time. Appendix C contains the project special provisions related to the SPS-6 construction. In general, the construction was performed according to the SPS-6 construction guidelines.

TABLE 2 Treatment and Rehabilitation Summary

STATION	SHRP ID	SURFACE PREPARATION	OVERLAY THICKNESS
240+95 to 250+95	170605	MAXIMUM PREPARATION	N/A
251+95 to 256+95	170661	DIAMOND GRINDING	N/A
264+95 to 269+95	170660	PAVEMENT MILLING	N/A
271+95 to 276+95	170601	CONTROL SECTION	N/A
278+95 to 286+95	170662	REFLECTIVE CRACK/GEOTEXTILE	4 INCHES
285+53 to 290+53	170606	MAXIMUM PREP W/ 4 INCH OVERLAY	4 INCHES
291+95 to 296+95	170603	MINIMUM PREP W/ 4 INCH OVERLAY	4 INCHES
300+50 to 305+50	170604	MINIMUM PREP W/ SAWING AND SEALING	4 INCHES
306+14 to 311+14	170659	ILLINOIS REHABILITATION	3-1/4 INCHES
316+95 to 321+95	170607	CRACK/SEAT WITH 4 INCH OVERLAY	4 INCHES
325+95 to 330+95	170608	CRACK/SEAT WITH 8 INCH OVERLAY	8 INCHES
335+95 to 340+95	170663	RUBBLIZATION W/ 8 INCH OVERLAY	8 INCHES
342+95 to 347+95	170664	RUBBLIZATION W/ 6 INCH OVERLAY	6 INCHES

### 2.3 Construction

In the experimental design, preparation and/or restoration of the existing pavements is classified into three levels minimal, intensive, and crack and seat or break and seat. The minimal and intensive treatments are applied with and without hot mix asphalt concrete overlays. Table 3 presents a summary of the types of treatments and/or restoration that were applied to each test section.

**Table 3 Construction Summary**

Section	Summary of Rehabilitation Treatments for Illinois SPS-6 Test Sections
170601	Control section - no work
170602	Minimal surface preparation, no overlay * performed joint and crack sealing * performed full depth patching
170603	Minimal surface preparation with 4 inch overlay * performed joint and crack sealing * performed full depth patching * placed a 4-in thick HMAC overlay
170604	Minimal surface preparation with saw and seal of 4 inch overlay * performed joint and crack sealing * performed full depth patching * placed a 4-in thick HMAC overlay * sawed and sealed overlay over existing PCC pavement joints and working
170605	Intensive surface preparation, no overlay * removed and replaced existing joint and crack sealing * performed additional joint and crack sealing * removed and replaced existing full depth patches * performed full diamond grinding * performed undersealing * installed subsurface edge drainage system
170606	Intensive surface preparation with 4 inch overlay * removed and replaced existing partial and full depth patches * performed undersealing * installed subsurface edge drainage system * placed a 4-in thick HMAC overlay
170607	Crack/break and seat section with 4 inch overlay * installed subsurface edge drainage system * crack/break and seat * placed a 4-in thick HMAC overlay
170608	Crack/break and seat section with 4 inch overlay * installed subsurface edge drainage system * crack/break and seat * placed a 4-in thick HMAC overlay
170659	Intensive surface preparation with 3-1/4 inch overlay * removed and replaced existing partial and full depth patches * performed undersealing * installed subsurface edge drainage system * placed a 3-1/4 in thick HMAC overlay



## 2.4 Mix Designs

Asphalt concrete mix designs for the project are provided in Table 4. There were three mixes used for paving. A leveling binder layer was placed on the PCC surface to correct the crown. The binder course was used above the leveling binder and was followed by the surface course.

**Table 4 Mix Designs**

### LEVEL UP BINDER

SIEVE	% PASSING
1"	100
3/4"	100
1/2"	100
3/8"	100
#4	60
#8	36
#16	25
#30	17
#50	9
#100	5.7
#200	5.5

NO OF BLOWS	75
A.C. CONTENT (%)	5.5
STABILITY	2290
FLOW	9
AIR VOIDS (%)	4.2
VMA	15.6
MAX. THEOR. DENSITY	2.44
BULK SP. GR.	2.34

### BINDER

SIEVE	% PASSING
1"	100
3/4"	96
1/2"	74
3/8"	63
#4	38
#8	23
#16	15
#30	10
#50	7
#100	5.1
#200	4.5

NO OF BLOWS	75
A.C. CONTENT (%)	4.5
STABILITY	2288
FLOW	
AIR VOIDS (%)	4.2
VMA	
MAX. THEOR. DENSITY	2.44
BULK SP. GR.	2.34

### SURFACE

SIEVE	% PASSING
1"	100
3/4"	100
1/2"	100
3/8"	99
#4	60
#8	36
#16	25
#30	17
#50	9
#100	5.9
#200	5.5

NO OF BLOWS	75
A.C. CONTENT (%)	5.5
STABILITY	2240
FLOW	8
AIR VOIDS (%)	4.9
VMA	16.1
MAX. THEOR. DENSITY	2.46
BULK SP. GR.	2.34



## 2.5 Paving

The asphalt concrete overlays were placed in three layers. The first layer was to be placed at a thickness of 3/4 in and was to level up the surface of the PCC before placement of the binder layer. The binder layer thickness was 1-3/4 in and 6-3/4 in for the 4 inch and 8 inch overlays and was followed by the surface course which was placed at a thickness of 1-1/4 in.

Placement of asphalt concrete began at the south end and proceeded north. The paving operation began on June 15, 1990, and ended on June 18, 1990. Laydown temperature readings ranged from 292 ° to 295 °F with an average temperature of 295 °F. Nuclear density gauge field density tests were taken. Three rollers were used for compaction: (1) Breakdown rolling with a double drum vibratory roller, (2) Intermediate rolling with a Pneumatic Tired Roller, (3) Final rolling with a steel wheel tandem roller.

## 2.6 Material Sampling and Testing

Pre/post-construction field material sampling and testing was performed according to the Specific Pavement Studies Construction Guidelines for Experiment SPS-6. The results of these tests were sent to the regional office in Minneapolis, Minnesota. Table 5 provides as-built thicknesses based on cores taken from the project for the core experiment and the agency supplemental (170659).

**Table 5 As-Built Thickness**

SECTIO	AC LEVELIN (IN)	AC LEVELIN (IN)	PCC (IN)	BASE (IN)
170601			10 00	6 00
170602			10 00	6 00
170603	1 50	2 20	10 10	6 00
170604	1 50	2 30	10 30	6 00
170605			10 00	6 00
170606	1 50	1 50	10 00	6 00
170607	1 40	1 80	10 10	6 00
170608	1 60	5 20	10 00	6 00
170659	*	*	10 20	6 00

\* No cores were taken to determine as-built thickness.

Falling Weight Deflectometer testing was performed by the NC Region LTPP office before construction and after construction.

## **3.0 INITIAL PERFORMANCE**

Inspections of the SPS-6 site after one year and three years of monitoring indicated the following trends:

- 170601 The severity of the existing transverse cracks increased slightly
- 170602 Little change since construction
- 170603 Some joints have reflected through the overlay, all were low severity
- 170604 No change since construction, some centerline longitudinal cracking was observed
- 170605 Some increase in the number of transverse cracks
- 170606 Longitudinal cracking of paving joints has occurred throughout test section Some transverse joints have reflected through overlay, all were low severity
- 170607 No reflection cracking has occurred
- 170608 No reflection cracking has occurred
- 170659 There were a total of 7 transverse cracks of which 4 were low severity, 2 were medium severity and 1 was high severity Some paving joint cracking was noted

**APPENDIX A**  
**SPS PROJECT DEVIATION REPORT**  
**PROJECT SUMMARY SHEET**



<b>LTPP SPS Project Deviation Report</b>		State Code <b>17</b>
<b>Project Summary Sheet</b>		Project Code <b>0600</b>
<b>Project Classification Information</b>		
SPS Experiment Number: <b>6</b>	State or Province: <b>ILLINOIS</b>	
LTPP Region:	<input type="checkbox"/> North Atlantic <input checked="" type="checkbox"/> North Central <input type="checkbox"/> Southern <input type="checkbox"/> Western	
Climate Zone:	<input type="checkbox"/> Dry-Freeze <input type="checkbox"/> Dry-No Freeze <input checked="" type="checkbox"/> Wet-Freeze <input type="checkbox"/> Wet-No Freeze	
Subgrade Classification:	<input checked="" type="checkbox"/> Fine Grain <input type="checkbox"/> Coarse Grain <input type="checkbox"/> Active (SPS-8 Only)	
Project Experiment Classification Designation (SPS 1, 2 and 8):		
Construction Start Date: <b>APRIL, 1990</b>	Construction End Date: <b>NOVEMBER, 1990</b>	
FHWA Incentive Funds Provided to Agency for this Project:		<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Deviation Summary</b>		
Site Location Deviations:	<input checked="" type="checkbox"/> No Deviations <input type="checkbox"/> Minor Deviations <input type="checkbox"/> Significant Deviations	
Construction Deviations:	<input type="checkbox"/> No Deviations <input checked="" type="checkbox"/> Minor Deviations <input type="checkbox"/> Significant Deviations	
<b>Data Collection and Processing Status Summary</b>		
Inventory Data (SPS 5,6,7,9):	<input type="checkbox"/> Complete Submission <input checked="" type="checkbox"/> Incomplete <input type="checkbox"/> Data Not Available	
Materials Data:	<input checked="" type="checkbox"/> All Scheduled Samples Obtained and Tested <input type="checkbox"/> Incomplete/No Test Data	
Construction Data:	<input checked="" type="checkbox"/> All Required Data Obtained <input type="checkbox"/> Incomplete/Missing Data Elements	
Historical Traffic Data:	<input type="checkbox"/> All Required Historical Estimates Submitted (SPS 5,6,7,9) <input type="checkbox"/> Required Estimates Not Submitted	
Traffic Monitoring Equipment:	<input checked="" type="checkbox"/> WIM Installed On-Site <input checked="" type="checkbox"/> AVC Installed On-Site <input type="checkbox"/> ATR Installed On-Site <input type="checkbox"/> No Equipment Installed	
Traffic Monitoring:	<input checked="" type="checkbox"/> Preferred <input type="checkbox"/> Continuous <input type="checkbox"/> Minimum <input type="checkbox"/> Below Minimum <input type="checkbox"/> Site Related	
Traffic Monitoring Data:	<input checked="" type="checkbox"/> Monitoring Data Submitted <input type="checkbox"/> No Monitoring Data Submitted	
FWD Measurements:	<input checked="" type="checkbox"/> Preconstruction Tests Performed <input checked="" type="checkbox"/> Construction Tests Performed <input checked="" type="checkbox"/> Post-construction Tests Performed	
Profile Measurements:	<input checked="" type="checkbox"/> Preconstruction Tests Performed <input checked="" type="checkbox"/> Post-construction Tests Performed	
Distress Measurements:	<input checked="" type="checkbox"/> Preconstruction Tests Performed <input checked="" type="checkbox"/> Post-construction Tests Performed	
Maint. & Rehab. Data:	<input checked="" type="checkbox"/> Complete Submission <input type="checkbox"/> Incomplete <input type="checkbox"/> Data Not Available	
Friction Data:	<input checked="" type="checkbox"/> Complete Submission <input type="checkbox"/> Incomplete <input type="checkbox"/> Data Not Available	
<b>Report Status</b>		
Materials Sampling and Test Plan:	<input checked="" type="checkbox"/> Document Prepared <input type="checkbox"/> Final Submitted to FHWA	
Construction Report:	<input checked="" type="checkbox"/> Document Prepared <input type="checkbox"/> Final Submitted to FHWA	
AWS: (SPS 1, 2, & 8)	<input type="checkbox"/> AWS Installed <input type="checkbox"/> AWS Installation Report Submitted to FHWA	

Page 1 of 1 Preparer Craig J. Kellan, SME Date 11/1/95

**APPENDIX B**  
**PLAN SHEETS**



DESIGNED BY J.C. ELLER  
PROJECT ENGINEER P.H. BEYER

FOR INDEX OF SHEETS SEE SHEET NO. 10  
FOR SUMMARY OF QUANTITIES SEE SHEET NO. 11

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
**PLANS FOR PROPOSED  
FEDERAL AID INTERSTATE HIGHWAY**

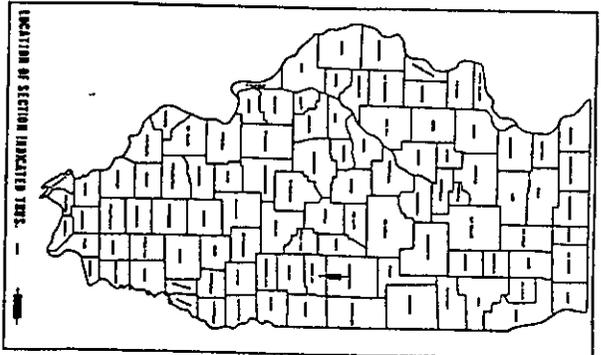
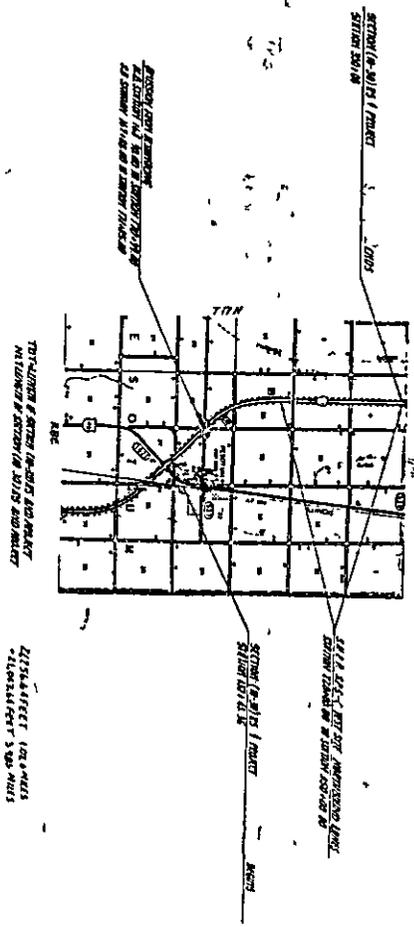
**F.A.I. ROUTE 57  
SECTION (10-30)RS  
CHAMPAIGN COUNTY  
PROJECT ACIR-57-5(170)220  
RESURFACING & UNDERDRAIN**

C-33-006 90

SCALE: 1" = 40'  
HORIZONTAL  
VERTICAL

DESIGN DESIGNATION  
MHW 441 (20) INTERSTATE 44 (10-1)

CONTRACT NO. 3312



DATE	BY	REVISION
10-1-57	J.C. ELLER	1
10-1-57	P.H. BEYER	2

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
APPROVED: *[Signature]*  
DATE: *[Date]*

ILLINOIS DEPARTMENT OF TRANSPORTATION  
CHAMPAIGN COUNTY  
DIVISION OF HIGHWAYS  
APPROVED: *[Signature]*  
DATE: *[Date]*

CHAMPAIGN COUNTY ROAD NO. 57 I.A.S. 1001 47

Red 1-5-57









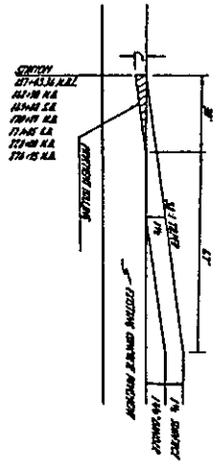




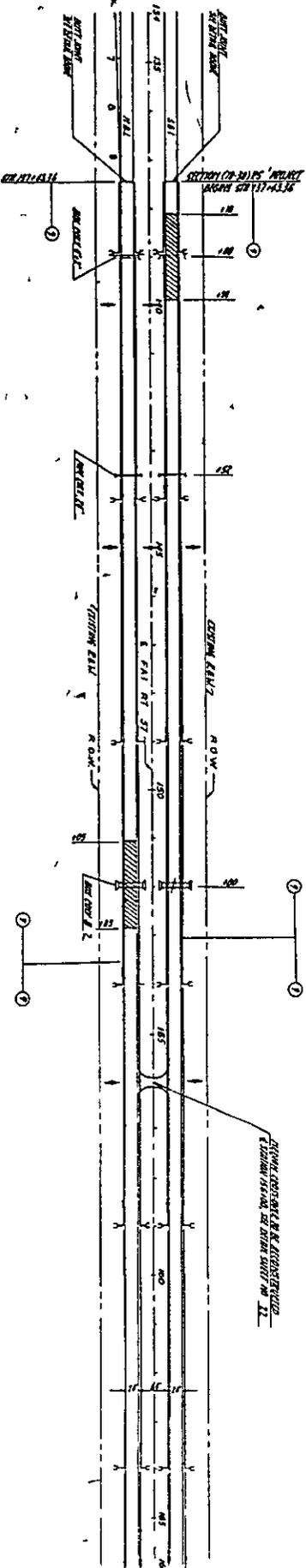




SECTION THROUGH CONCRETE BRIDGE



CONCRETE  
 12'-0" HA  
 12'-0" HA  
 12'-0" HA  
 12'-0" HA  
 12'-0" HA  
 12'-0" HA



NOTE: CONCRETE BRIDGE DECK AND GIRDERS  
 TO BE CONSTRUCTED IN ACCORDANCE WITH  
 SECTION 105.00 OF THE STANDARD SPECIFICATIONS FOR  
 THE STATE OF TEXAS

GENERAL CONTRACT AND OTHER NOTES

ITEM	DESCRIPTION	QUANTITY	UNIT	PRICE
1	CONCRETE	100	CU YD	100.00
2	STEEL	100	TON	100.00
3	PAVING	100	SQ YD	100.00
4	GRASS	100	SQ YD	100.00
5	LANDSCAPING	100	SQ YD	100.00
6	UTILITIES	100	LINEAL FT	100.00
7	CONCRETE	100	CU YD	100.00
8	STEEL	100	TON	100.00
9	PAVING	100	SQ YD	100.00
10	GRASS	100	SQ YD	100.00
11	LANDSCAPING	100	SQ YD	100.00
12	UTILITIES	100	LINEAL FT	100.00
13	CONCRETE	100	CU YD	100.00
14	STEEL	100	TON	100.00
15	PAVING	100	SQ YD	100.00
16	GRASS	100	SQ YD	100.00
17	LANDSCAPING	100	SQ YD	100.00
18	UTILITIES	100	LINEAL FT	100.00
19	CONCRETE	100	CU YD	100.00
20	STEEL	100	TON	100.00
21	PAVING	100	SQ YD	100.00
22	GRASS	100	SQ YD	100.00
23	LANDSCAPING	100	SQ YD	100.00
24	UTILITIES	100	LINEAL FT	100.00
25	CONCRETE	100	CU YD	100.00
26	STEEL	100	TON	100.00
27	PAVING	100	SQ YD	100.00
28	GRASS	100	SQ YD	100.00
29	LANDSCAPING	100	SQ YD	100.00
30	UTILITIES	100	LINEAL FT	100.00

GENERAL CONTRACT AND OTHER NOTES

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9	PAVING	100	SQ YD	100.00
10	GRASS	100	SQ YD	100.00
11	LANDSCAPING	100	SQ YD	100.00
12	UTILITIES	100	LINEAL FT	100.00
13	CONCRETE	100	CU YD	100.00
14	STEEL	100	TON	100.00
15	PAVING	100	SQ YD	100.00
16	GRASS	100	SQ YD	100.00
17	LANDSCAPING	100	SQ YD	100.00
18	UTILITIES	100	LINEAL FT	100.00
19	CONCRETE	100	CU YD	100.00
20	STEEL	100	TON	100.00
21	PAVING	100	SQ YD	100.00
22	GRASS	100	SQ YD	100.00
23	LANDSCAPING	100	SQ YD	100.00
24	UTILITIES	100	LINEAL FT	100.00
25	CONCRETE	100	CU YD	100.00
26	STEEL	100	TON	100.00
27	PAVING	100	SQ YD	100.00
28	GRASS	100	SQ YD	100.00
29	LANDSCAPING	100	SQ YD	100.00
30	UTILITIES	100	LINEAL FT	100.00

GENERAL CONTRACT AND OTHER NOTES

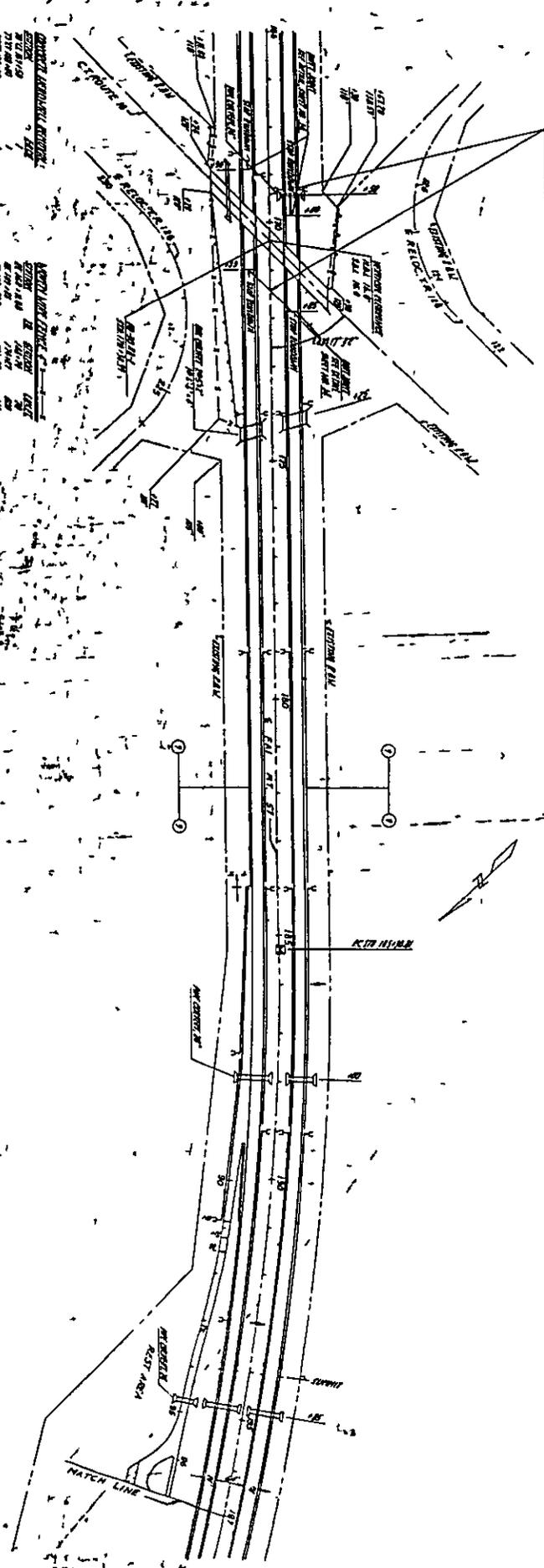
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6	UTILITIES	100	LINEAL FT	100.00
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8	STEEL	100	TON	100.00
9	PAVING	100	SQ YD	100.00
10	GRASS	100	SQ YD	100.00
11	LANDSCAPING	100	SQ YD	100.00
12	UTILITIES	100	LINEAL FT	100.00
13	CONCRETE	100	CU YD	100.00
14	STEEL	100	TON	100.00
15	PAVING	100	SQ YD	100.00
16	GRASS	100	SQ YD	100.00
17	LANDSCAPING	100	SQ YD	100.00
18	UTILITIES	100	LINEAL FT	100.00
19	CONCRETE	100	CU YD	100.00
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21	PAVING	100	SQ YD	100.00
22	GRASS	100	SQ YD	100.00
23	LANDSCAPING	100	SQ YD	100.00
24	UTILITIES	100	LINEAL FT	100.00
25	CONCRETE	100	CU YD	100.00
26	STEEL	100	TON	100.00
27	PAVING	100	SQ YD	100.00
28	GRASS	100	SQ YD	100.00
29	LANDSCAPING	100	SQ YD	100.00
30	UTILITIES	100	LINEAL FT	100.00

DATE	10/30/21
BY	J. J. JONES
CHECKED	M. M. M. M.
SCALE	AS SHOWN
PROJECT	CONCRETE BRIDGE
SHEET	10 OF 10

10-1-2

GENERAL NOTES

1. ALL DIMENSIONS ARE IN FEET AND INCHES.
2. THE CENTERLINE OF THE CANAL IS SHOWN BY A DASHED LINE.
3. THE RIGHT BANK IS TO THE RIGHT OF THE CENTERLINE.
4. THE LEFT BANK IS TO THE LEFT OF THE CENTERLINE.
5. THE CANAL IS TO BE CONSTRUCTED TO A DEPTH OF 10 FEET BELOW THE FINISHED GRADE OF THE RIGHT BANK.
6. THE CANAL IS TO BE CONSTRUCTED TO A WIDTH OF 20 FEET AT THE HEADS.
7. THE CANAL IS TO BE CONSTRUCTED TO A WIDTH OF 10 FEET AT THE TAILS.
8. THE CANAL IS TO BE CONSTRUCTED TO A SLOPE OF 1:1 ON BOTH SIDES.
9. THE CANAL IS TO BE CONSTRUCTED TO A SLOPE OF 1:1 ON BOTH SIDES.
10. THE CANAL IS TO BE CONSTRUCTED TO A SLOPE OF 1:1 ON BOTH SIDES.



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10. THE CANAL IS TO BE CONSTRUCTED TO A SLOPE OF 1:1 ON BOTH SIDES.

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
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REV











**APPENDIX C**  
**SPECIAL PROVISIONS**



132

Proposal Submitted By
Name
Address
City

Letting

FEBRUARY 2, 1990

585-6  
ILL

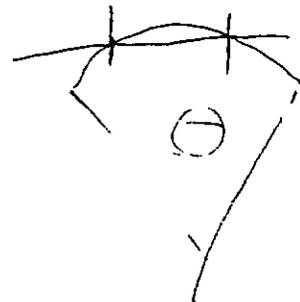
# Notice to Bidders, Specifications, Proposal, Contract and Contract Bond



Illinois Department  
of Transportation  
Springfield, Illinois 62764

Federal-aid Interstate \_\_\_\_\_ Route No 57  
 Project No ACIR-57-5 (170)220  
 Section (10-30)RS  
 \_\_\_\_\_ Champaign \_\_\_\_\_ County  
 Construction Funds - District 5  
 Contract No 90128

**NOT FOR BIDDING**



Prepared by
Checked by

PIPE UNDERDRAINS: This work shall conform to Section 607 of the Standard Specifications for Road and Bridge Construction, and Standard 2327 except CA-16 meeting Article 704.07(a), Description, and Article 704.07(b), Quality, shall be used in lieu of FA-1 or FA-2 for trench backfill.

GUARDRAIL-SHOULDER TRANSITION: 5-628D4-87. The Shoulder Widening Transition required for Traffic Barrier Terminal, Type 1, as shown on Standard 2336, will not be paid for separately. Minor shaping of the ditch and backslope may also be necessary to construct the widening transition.

The Shoulder Widening Transition shall be seeded and mulched as directed by the Engineer, and all costs, including earthwork, will be considered included in the cost of Traffic Barrier Terminal, Type 1, and no additional compensation will be allowed.

CONCRETE HEADWALLS FOR PIPE DRAINS: 5-643D2-87 - The area around the proposed concrete headwalls for the pipe drains shall be seeded with Seeding, Class 2 and covered with Excelsior Blanket. The slopes around the headwalls shall be graded in accordance with Section B-B shown on Standard 2327.

Seeding, Class 2 and the Excelsior Blanket shall be placed 18 inches wide above and along each side of the headwall, and 24 inches beyond the downstream end of the headwall. Each headwall requires approximately 2 square yards of cover materials.

This work will be paid for at the contract unit price per square yard for EXCELSIOR BLANKET which price shall include the earth excavation required to grade the slopes and the required seeding, and no additional compensation will be allowed. The excavated material shall be disposed of on the sideslopes to the satisfaction of the Engineer.

STRATEGIC HIGHWAY RESEARCH PROGRAM (SHRP): This program consists of fourteen test segments under the Specific Pavement Studies Number Six (SPS-6) format. The locations of these sections have been shown in the plans. Since this is a national research effort and uniformity is desired, construction procedures will be followed as specified herein and as directed by the Engineer.

S.H.R.P. MINIMUM PREPARATION AREA - NO OVERLAY (SHRP #170602): Minimum preparation is defined as that work that is absolutely necessary to repair the pavement surface for vehicle use. This will include some full depth patching of failed pavement areas, sealing of transverse and longitudinal joints, sealing of mid-panel cracks, and the removal and replacement of the bituminous shoulders.

S.H.R.P. MINIMUM PREPARATION AREA - NO OVERLAY (SHRP #170602) (Continued):

Full depth patching will be done in accordance with the Standard Specification for Pavement Patching and Standard 2426 entitled Class B Patches.

Crack and joint sealing will be done as described in the Special Provision for CRACK AND JOINT SEALING JOINTED P.C. CONCRETE PAVEMENT.

Removal and replacement of the bituminous shoulders will be done in accordance with the Special Provision for BITUMINOUS SHOULDER REMOVAL AND REPLACEMENT.

S.H.R.P. MAXIMUM PREPARATION AREA - NO OVERLAY (SHRP #170605): Maximum preparation is defined as extensive pavement repair. This work will include full depth pavement patching of failed joints and mid-panel cracks, sub sealing of faulted joints and mid-panel cracks, routing and sealing of transverse and longitudinal joints and mid-panel cracks, the installation of a pipe underdrain system, diamond grinding of the pavement surface, and the removal and replacement of the bituminous shoulders.

Full depth patching, crack and joint sealing, pipe underdrains, and bituminous shoulder removal and replacement will be done as described in the special provision entitled S.H.R.P. MINIMUM PREPARATION - NO OVERLAY.

Pavement subsealing will be done in accordance with Check Sheet #30 of the Recurring Special Provisions. The hole pattern to be used will be as shown in the Typical Hole Pattern for Pavement Sub Sealing Detail in the plans and as directed by the Engineer.

Diamond grinding will be done in accordance with the Special Provision entitled DIAMOND GRINDING.

S.H.R.P. PAVEMENT MILLING - NO OVERLAY (SHRP #170610): The work in this area will include the work as described in the special provision entitled SHRP MAXIMUM PREPARATION AREA - NO OVERLAY. Partial depth patching will be done to areas of spalling and high steel. After this work is completed the pavement will be milled and the bituminous shoulders will be removed and replaced.

Partial depth patching will be done as shown in the Pavement Patching (Partial Depth) Detail. Pavement milling will be done in accordance with the special provision for PAVEMENT MILLING.

Removal and replacement of the bituminous shoulder will be in accordance with the special provision for BITUMINOUS SHOULDER REMOVAL AND REPLACEMENT.

S.H.R.P. DIAMOND GRINDING - NO OVERLAY (SHRP #170611): The work in this area will include the work described in the special provision entitled SHRP MAXIMUM PREPARATION AREA - NO OVERLAY. Partial depth patching will be done to areas of spalling and high steel. After this work is completed the pavement will be ground and the bituminous shoulders will be removed and replaced.

Partial depth patching will be done as shown in the Pavement Patching (Partial Depth) Detail. Pavement grinding will be done in accordance with the special provision for DIAMOND GRINDING.

Removal and replacement of the bituminous shoulders will be in accordance with the special provision for BITUMINOUS SHOULDER REMOVAL AND REPLACEMENT.

S.H.R.P. - CONTROL SECTION (SHRP #170601): For comparison testing this section will remain in place in the condition it is presently in. There will not be any rehabilitation work done to this area.

*etc,*  
S.H.R.P. - REFLECTIVE CRACK CONTROL SECTION - 3 1/4" OVERLAY (SHRP #170612): This section will consist of full-depth patching of failed pavement areas and applying a reflective crack control mat over the existing transverse joints and the working mid panel cracks prior to a 3 1/4 inch bituminous overlay.

The pavement patching will be done as described in the special provision entitled S.H.R.P. MINIMUM PREPARATION AREA - NO OVERLAY.

The reflective crack control mat will be as described in the special provision entitled REFLECTIVE CRACK CONTROL MAT and as shown in the detail for Reflective Crack Control Mat.

S.H.R.P. MAXIMUM PREPARATION - 4 INCH OVERLAY (SHRP #170606): The work in this section will include full depth patching, sub sealing of faulted joints and mid-panel cracks, and the installation of a pipe underdrain system. This pavement preparation work will be done as described in the special provision entitled SHRP MAXIMUM PREPARATION AREA - NO OVERLAY except no diamond grinding will be done. The prepared pavement will then be overlaid with four inches of bituminous concrete. This overlay will consist of a 3/4 inch level binder lift, a 1 3/4 inch binder lift, and a 1 1/2 inch surface lift.

S.H.R.P. MINIMUM PREPARATION - 4 INCH OVERLAY (SHRP #170603): The work in this section will include sealing of the mid panel cracks and the transverse and longitudinal joints, and patching of failed pavement joints. The pavement preparation work will be done as described in the special provision entitled S.H.R.P. MINIMUM PREPARATION AREA - NO OVERLAY. The prepared pavement will then be overlaid with four inches of bituminous concrete as described in the special provision entitled S.H.R.P. MAXIMUM PREPARATION - 4 INCH OVERLAY.

F.A.I. Route 57  
Section (10-30)RS  
Champaign County

S.H.R.P. MINIMUM PREPARATION - 4 INCH OVERLAY - SAW AND SEAL (SHRP #170604): The work in this section will be the same as described in the special provision entitled SHRP MINIMUM PREPARATION 4 INCH OVERLAY. In addition the bituminous overlay will be sawed and sealed in accordance with the special provision entitled SAWING AND SEALING BITUMINOUS CONCRETE OVERLAY and as shown in the Detail for Sawing and Sealing Bituminous Concrete Overlay.

S.H.R.P. ILLINOIS REHABILITATION - 3 1/4 INCH OVERLAY (SHRP #170609): The work in this area will include pavement patching, subsealing of faulted joints and mid-panel cracks, and the installing of a pipe underdrain system. A 3 1/4 bituminous concrete overlay will be placed over the prepared pavement.

Pavement patching, sub sealing and installing the pipe underdrains will be done as described in the special provision entitled SHRP MAXIMUM PREPARATION AREA - NO OVERLAY.

The bituminous concrete overlay will consist of a 1 3/4 inch binder course and a 1 1/2 inch surface course.

S.H.R.P. CRACK AND SEAT - 4 INCH OVERLAY (SHRP #170607): The work involved in this section will include cracking the pavement with a guillotine type hammer and seating the cracked sections with a pneumatic roller. The pavement will then be resurfaced with 4 inches of bituminous concrete.

Pipe underdrains will be installed in accordance with the Standard Specifications and Standard 2327 entitled "Sub-Surface Drains."

Cracking and seating will be done in accordance with the Special Provision for PAVEMENT CRACKING AND SEATING.

The bituminous resurfacing will consist of a 3/4 inch level binder, a 1 3/4 inch binder course, and a 1 1/2 inch surface course.

S.H.R.P. CRACK AND SEAT - 8 INCH OVERLAY (SHRP #170608): This section will have the pavement cracked and seated and have an eight inch resurfacing applied.

Pipe underdrains will be installed in accordance with the Standard Specifications and Standard 2327 entitled "Sub-Surface Drains."

The cracking and seating will be done as described in the Special Provision for PAVEMENT CRACKING AND SEATING.

The bituminous overlay will consist of binder lifts of 2 inches, 2 3/4 inches and 1 3/4 inches and a surface lift of 1 1/2 inches.

F.A.I. Route 57  
Section (10-30)RS  
Champaign County

S.H.R.P. RUBBLIZATION - 8 INCH OVERLAY (SHRP #170613): This work will include rubblizing the existing pavement with a resonant pavement breaker, compacting this pavement and resurfacing the rubblized pavement with 8 inches of bituminous concrete.

Pipe underdrains will be installed in accordance with the Standard Specifications and Standard 2327 entitled "Sub-Surface Drains."

Rubblization will be done in accordance with the special provision entitled RUBBLIZING PORTLAND CEMENT CONCRETE PAVEMENT contained elsewhere herein.

The bituminous concrete overlay will consist of binder lifts of 2 inches, 2 3/4 inches and 1 3/4 inches and a surface course lift of 1 1/2 inches.

S.H.R.P. - RUBBLIZATION - 6 INCH OVERLAY (SHRP #170614): The work included in this section will be to rubblize the existing concrete pavement with a resonant pavement breaker, compact this pavement and resurface the rubblized pavement with six inches of bituminous concrete.

Pipe underdrains will be installed in accordance with the Standard Specifications and Standard 2327 entitled "Sub-Surface Drains."

Rubblization will be done in accordance with the special provision entitled RUBBLIZING PORTLAND CEMENT CONCRETE PAVEMENT contained elsewhere herein.

The bituminous concrete overlay will consist of level binder lifts of 2 3/4 inches and 1 3/4 inches and a surface course lift of 1 1/2 inches.

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISIONS  
FOR  
CRACK AND JOINT SEALING JOINTED  
P.C. CONCRETE PAVEMENT

Effective February 15, 1988

SEALING CRACKS (PAVEMENT): This work consists of routing, cleaning and sealing longitudinal shoulder joints, transverse and longitudinal random cracks, centerline joint, and transverse expansion and contraction joints in jointed p.c. concrete pavement as shown in the plan details, as directed by the Engineer, and as described herein.

Materials: Hot-poured sealer shall be an elastic type and shall comply with the requirements of Article 716.04 of the Standard Specifications; this material complies with the requirements of ASTM D 3405. Sampling and testing will be in accordance with the provisions of Articles 106.03 and 106.04 of the Standard Specifications.

Equipment: The routing machine to be used for routing cracks and joints shall have a cutter that consists of radially located steel cutters mounted on a circular cutter head. The routing machine shall also be capable of cutting a uniform square shape approximately 3/4 inch by 3/4 inch in either a straight or irregular line. A double-jacketed kettle shall be used for heating the sealer.

Construction Requirements: The purpose of this contract is to rout, clean and seal longitudinal shoulder joints, transverse and longitudinal random cracks, centerline joint, and transverse expansion and contraction joints in jointed p.c. concrete pavement.

The longitudinal shoulder joint between the edge of pavement and the newly placed bituminous shoulder, the transverse and longitudinal random cracks, the contraction joint and the centerline joint shall be routed to approximately 3/4" wide by 3/4" deep as close to a one-to-one ratio as possible. When routing the longitudinal shoulder joint, the router used shall be capable of following the path of the joint without causing excessive spalling or damage to the adjacent rigid pavement. If old sealants are present in the joint or crack, they shall be removed prior to routing.

After routing is completed, dust and debris shall be blown from the joint or crack with a power brush/blower or with compressed air. If compressed air is used, the pneumatic tool lubricator must be bypassed and a filter installed on the discharge valve to keep water and oil out of the lines.

Hot asphalt sealer shall be stirred during heating so that localized heating does not occur. Poured crack sealer shall not be placed when the air temperature in the shade is less than 40°F.

Areas along the longitudinal shoulder joint, the transverse random crack, the contraction joint or the centerline joint where a void exists that exceeds 3/4" in depth shall be provided with a backer rod to control the

-2-

depth of sealant. The void shall be routed (if necessary) to provide a depth from the top of the backer rod to the top of the pavement of 3/4". Furnishing and installation of the backer rod will be paid for in accordance with Article 109.04 of the Standard Specifications.

The areas where backer rod will be required shall be as directed by the Engineer. The backer rod diameter shall be 1/8" wider than the routed joint. The backer rod shall be a closed-cell, plastic-foam, heat resistant, chemically inert, waterproof, rod compatible with the sealant used.

Sealant shall be placed in the clean, dry crack. The longitudinal shoulder joint, the transverse random cracks, the contraction joint and the centerline joint shall be slightly overfilled and immediately squeegeed to provide a "Band-Aid" type effect approximately 2" wide flush with the pavement surface with the edges feathered out.

The sealant shall be allowed to cure before opening to traffic. The sealant should be tack free in about 10 minutes. If necessary, the sealant may be dusted with sand or covered with tissue paper to prevent tracking.

The procedure for routing, cleaning and sealing longitudinal random cracks will be the same as the longitudinal shoulder joint, except the crack reservoir shall be sealed flush rather than providing an oversealed or "band-aid" type effect.

Transverse expansion joints shall be routed to create an approximate 1 inch deep reservoir. The walls of the joint shall be cleaned and refaced. The reservoir shall be filled flush with sealant.

Method of Measurement:

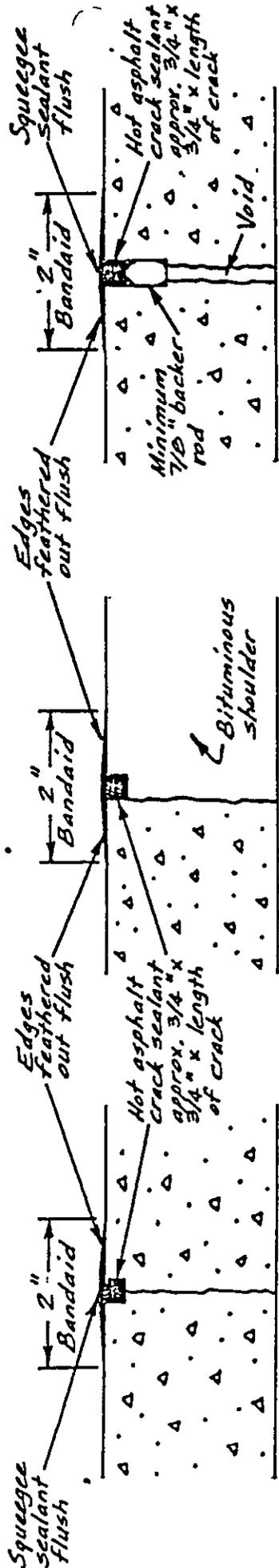
- (a.) Joint or Crack Routing: Routed joints or cracks will be measured for payment in lineal feet, measured along the routed joint or crack.
- (b.) Joint or Crack Filling: Filling of joints or cracks will be measured for payment in pounds of sealant used. The cost of cleaning the joint or crack shall be included in the price bid for joint or crack filling. Pounds of sealant used will be determined by counting the containers of sealant used, multiplied by the indicated pounds of each container.

Basis of Payment:

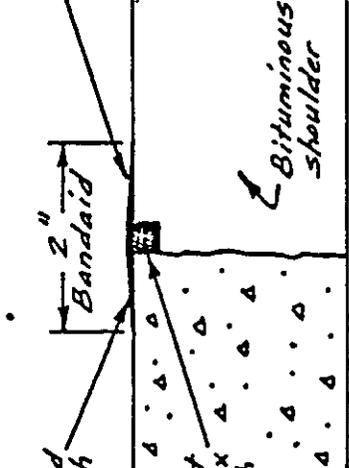
- (a.) Joint or Crack Routing: This work will be paid for at the contract unit price per lineal foot for JOINT OR CRACK ROUTING (PCC CONCRETE PAVEMENT) and JOINT OR CRACK ROUTING (BITUMINOUS SHOULDER), measured as specified herein, which price shall include furnishing all labor and equipment necessary to complete the work.
- (b.) Joint or Crack Filling: This work will be paid for at the contract unit price per pound of JOINT OR CRACK FILLING sealant used which price shall include the cleaning of the joint or crack and the furnishing and pouring of the sealant.

TYPICAL DETAILS FOR CRACK AND JOINT SEALING FOR JOINTED P.C. PAVEMENT

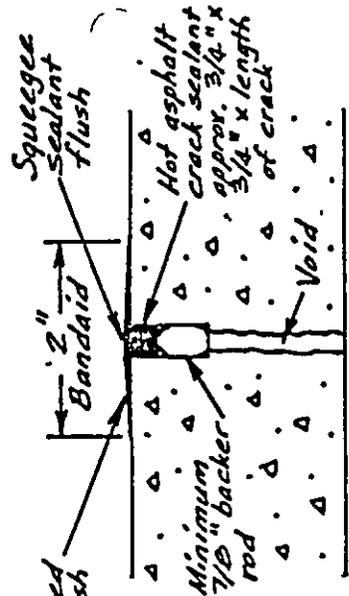
TRANSVERSE CRACKS AND JOINTS AND CENTERLINE JOINT



LONGITUDINAL SHOULDER JOINT

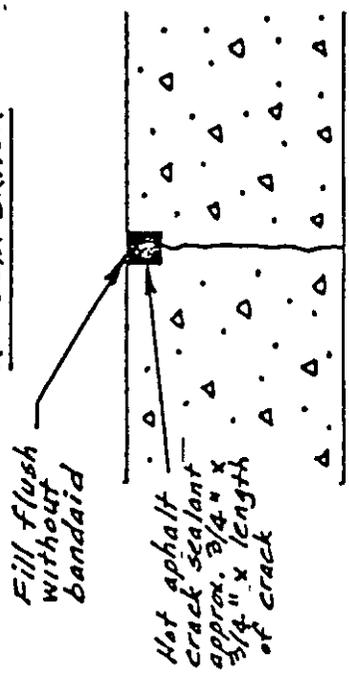


ANY WIDE JOINT OR CRACK

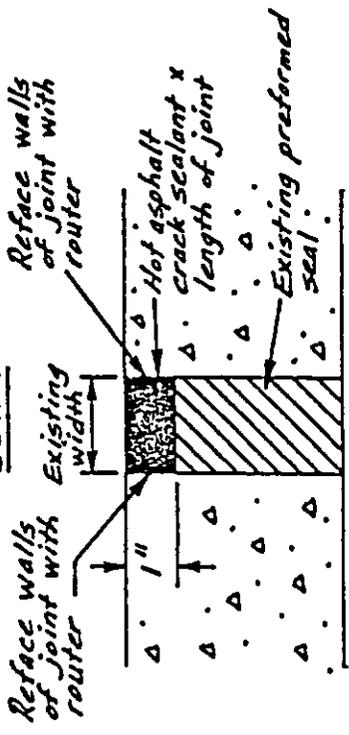


F.A.I. Route 57  
 Division (10-30)RS  
 Campaign County

LONGITUDINAL RANDOM CRACK



TRANSVERSE EXPANSION JOINT



NOT TO SCALE  
OCT. - 1987

**PAVEMENT MILLING:** This work shall consist of milling all lanes in a longitudinal direction to a nominal depth of 3/8-inch or to remove the faulting. The entire surface of the lanes shall be milled so that the pavement surface on both sides of all transverse joints and cracks are in the same plane and the stipulated smoothness requirements are met. The milling shall be performed against the normal flow of traffic and shall produce a uniform texture.

**Equipment:** Equipment shall meet the following requirements:

- a) Carbide tipped tooth planing or milling machine shall be equipped with a cutting mandrel designed specifically for grinding asphalt and concrete surfaces to close tolerances. The "grinding and texturing" mandrel shall have a minimum of two wraps of flighting, with carbide tipped cutting tips. The second wrap of flighting trails the first wrap by 180 degrees. Tips of the carbide teeth, on any given wrap, are to be spaced at a maximum 0.4" axial distance between the tips of each tooth, plus or minus 0.02". The carbide teeth on the second wrap are to split the difference of the proceeding wrap of 0.2".

The carbide cutting teeth in the mandrel are to be uniform in size. The length of the carbide cutting teeth shall be uniform within plus or minus 0.020".

The height of the tooth holder blocks are to be uniform and not vary the cutting radius of the mandrel by plus or minus 0.020".

The equipment shall be such that it will not cause strain or damage to the underlying surface of the pavement. Equipment that causes excessive ravels, aggregate fractures, spalls, or disturbance of the transverse joints, longitudinal joints or cracks will not be permitted. The Engineer shall be the sole judge as to the acceptability of the equipment.

- b) Mechanical Sweeper - Article 801.03.

#### Construction Requirements

**General:** If any patching should be needed, pavement shall be patched full and partial depth prior to milling operations. Pavement subsealing will also be completed prior to milling.

Forward speed of milling or planing machine shall be determined by the Engineer. Forward speed of the milling operations relates directly to the mandrel in the milling or planing equipment. The number of wraps of flighting, the pitch (axial distance per 360°) of the flighting, RPM and the diameter of the mandrel, all interact to give the best cutting speed for each different machine.

Milling shall be performed in the longitudinal direction so that milling begins and ends at lines normal to the pavement centerline at the project limits and omission limits.

The maximum overlap between passes shall be 2 inches.

Routing and sealing, if needed, will be done after the milling operations.

PAVEMENT MILLING (Continued):

Milling Procedure:

Carbide Tooth Planing or Milling - Construction operations shall produce a uniform finished surface of the required textures.

The entire areas designated on the plans and established by the Engineer shall be milled. The operation shall result in a pavement that conforms to the required cross section. Substantially all of the pavement surface shall be textured except that extra depth grinding to eliminate minor depressions in order to provide texturing for 100% of the pavement surfaces will not be required. The accumulated total of such excluded areas shall not exceed 5 percent of the total area to be milled.

When only changing intermittent teeth; an existing "sample" carbide tooth is to be removed from the machine and measured to determine amount of wear and/or gage height. Replacement teeth shall be matched to the existing height of the "sample" carbide tooth, plus or minus 0.020 inches, to insure even grinding.

After the forward speed has been established by the Engineer for the best pattern for rideability and skid numbers the milling operation is not be halted for the loading or unloading of trucks. The milling operation is to be continuous in order to produce the best overall pattern.

Carbide tipped tooth is used to produce a pavement surface that is true to grade and cross section. This texture shall consist of a matted type surface that will have a transverse pattern of 0.2" center to center of each strike area. The difference between the high and low of the matted surface shall not exceed 0.0625 inch.

Existing Pavement: The existing P.C. Concrete pavement was constructed in 1964 using dolimitic limestone.

Before opening a lane to traffic, it shall be cleaned with a mechanical broom, and the pavement and shoulders shall be washed down with water under sufficient pressure to clean the dust off the pavement.

Tolerances: The milled surface will be profilographed by the State. The milling equipment shall have produced a surface having a Profile Index of 15 inches per mile or less. In addition to the Profile Index requirement, all areas represented by high points having deviations in excess of 0.3 inch in 25 feet, or less, shall be unacceptable. The Contractor shall remill any areas not meeting the above requirements.

PAVEMENT MILLING (Continued):

Method of Measurement: Milling will be measured in place and the area computed in square yards. The square yards measured will be paid for only once regardless of the number of passes needed to achieve acceptable results.

Basis of Payment: This work will be paid for at the contract unit price per square yard for PAVEMENT MILLING which price shall include all labor, equipment, material and other incidental items necessary to complete the work as described herein. The removal of the rap material will also be included in the price for PAVEMENT MILLING and no additional compensation will be allowed.

DIAMOND GRINDING: This work shall consist of grinding all lanes in a longitudinal direction to a nominal depth of 3/8-inch or to remove the faulting. The entire surface of the lanes shall be ground so that the pavement surface on both sides of all transverse joints and cracks in the same plane and the stipulated smoothness requirements are met. The grinding shall be performed against the normal flow of traffic and shall produce a uniform texture.

Equipment: Equipment shall meet the following requirements:

- a) Diamond Grinding shall be accomplished by utilizing diamond blades, mounted on a self-propelled machine that has been specifically designed for diamond saw grinding. The equipment shall be such that it will not cause strain or damage to the underlying surface of the pavement. Equipment that causes excessive ravels, aggregate fractures, spalls, or disturbance of the transverse joints, longitudinal joints or cracks will not be permitted. The Engineer shall be the sole judge as to the acceptability of the equipment.

Construction Requirements

General: If any patching should be needed, pavement shall be patched full and partial depth prior to grinding operations. Pavement subsealing will also be completed prior to grinding operations.

Grinding shall be performed in the longitudinal direction so that grinding begins and ends at lines normal to the pavement centerline at the project limits and omission limits.

The maximum overlap between passes shall be 2 inches.

Routing and sealing, if needed, will be done after grinding operation.

DIAMOND GRINDING (Continued):

Grinding Procedure:

Diamond Grinding - The surface of the ground pavement shall have grooves between 0.10 inches and 0.15 inches wide, spaced 0.065 inches to 0.10 inches apart. The peaks of the ridges shall be approximately 1/16 inch higher than the bottom of the grooves.

Existing Pavement: The existing P.C. Concrete pavement was constructed in 1964 using dolomitic limestone.

Clean Up: Removal of all slurry or residue resulting from the grinding operation shall be continuous. Slurry or residue will not be allowed to encroach on open lanes.

Tolerances: The ground surface will be profilographed by the State. The grinding equipment shall have produced a surface having a Profile Index of 15 inches per mile or less. In addition to the Profile Index requirement, all areas represented by high points having deviations in excess of 0.3 inch in 25 feet, or less, shall be unacceptable. The Contractor shall regrind any areas not meeting the above requirements.

Method of Measurement: Grinding will be measured in place and the area computed in square yards. The square yards measured will be paid for only once regardless of the number of passes needed to achieve acceptable results.

Basis of Payment: This work will be paid for at the contract unit price per square yard for DIAMOND GRINDING which price shall include all labor, equipment, material and other incidental items necessary to complete the work as described herein.

SAWING AND SEALING BITUMINOUS CONCRETE OVERLAY: This work consists of sawing, cleaning and sealing the proposed bituminous concrete overlay over the existing portland cement concrete joints and working mid panel cracks.

Materials: Hot-poured sealer shall be an elastic type and shall comply with the requirements of Article 716.04 of the Standard Specifications; this material complies with the requirements of ASTM D 3405. Sampling and testing will be in accordance with the provisions of Articles 106.03 and 106.04 of the Standard Specifications.

Construction Requirements: The sawing operation shall be initiated between 3 and 14 days after placement of the bituminous concrete surface course. The sawing shall be done with a diamond blade saw to a depth of  $t/3$  with "t" equal to the thickness of the asphalt overlay.

After sawing is completed, dust and debris shall be blown from the crack with a power brush/blower or with compressed air. If compressed air is used, the pneumatic tool lubricator must be bypassed and a filter installed on the discharge valve to keep water and oil out of the lines.

Hot asphalt sealer shall be stirred during heating so that localized heating does not occur. Poured crack sealer shall not be placed when the air temperature in the shade is less than 40°F.

Sealant shall be placed in the clean, dry crack. The crack shall be slightly overfilled and immediately squeegeed to provide a "Band-Aid" type effect approximately 2" wide flash with the pavement surface with the edges feathered out.

The sealant shall be allowed to cure before opening to traffic. The sealant should be tack free in about 10 minutes. If necessary, the sealant may be dusted with sand or covered with tissue paper to prevent tracking.

Method of Measurement:

- a) Crack Sawing: Routed cracks will be measured in payment in lineal feet, measured along the sawed crack.
- b) Crack Filling: Filling of cracks will be measured for payment in pounds of sealants used. The cost of cleaning the crack shall be included in the price bid for crack filling. Pounds of sealant used will be determined by counting the containers of sealant used, multiplied by the indicated pounds of each container.

SAWING AND SEALING BITUMINOUS CONCRETE OVERLAY (Continued):

Basis of Payment:

- a) Crack Sawing: This work will be paid for at the contract unit price per lineal foot for CRACK SAWING (PAVEMENT), measured as specified herein, which price shall include furnishing all labor and equipment necessary to complete the work.
- b) Crack Filling: This work will be paid for at the contract unit price per pound of JOINT OR CRACK FILLING sealant used which price shall include the cleaning of the crack and the furnishing and pouring of the sealant.

PAVEMENT CRACKING AND SEATING: This work shall consist of furnishing all equipment and labor necessary to crack and seat the existing pavement at those locations shown on the plans and as described herein.

Equipment: The equipment shall be capable of delivering sufficient dynamic force and crack the pavement full-depth. However, the cracking is not to be destructive.

The pavement breaker shall incorporate a guided free-falling drop weight of no less than 12,000 pounds and between 5-1/2 and 6-1/2 feet wide. The pavement breaker shall be capable of producing full-lane width transverse cracking. Unguided free-falling weights such as headache or wrecking balls will not be allowed.

PAVEMENT CRACKING AND SEATING (Continued):

A 35 ton pneumatic tire proof roller shall be used to seat the pavement. The roller shall meet the requirements of Article 801.01b of the Standard Specifications.

Construction Requirements: The existing portland cement concrete pavement shall be cracked into 1-1/2 feet square pieces in place using equipment as described herein and approved by the Engineer. The cracking shall crack the pavement to insure that the existing steel mesh reinforcement is ruptured.

Cracking will not be permitted over drainage facilities, and shall be stopped 2 feet either side of the drainage facilities. The Engineer will mark the limits in these areas prior to cracking the pavement.

Prior to cracking and seating, the pavement, the required pipe underdrain system shall be installed and functioning.

Before cracking operations can begin, the Engineer will designate test sections. The Contractor shall crack the test section using varying energy and striking patterns, as designated by the Engineer, until a pattern is established that cracks the pavement to the extent required. In order to substantiate that the pavement cracking equipment is operating properly, the Contractor shall furnish a means of coring the pavement after cracking so the extent of the cracking can be readily determined. The pattern thus established shall be used to crack the pavement on the remainder of the project or until such time as the Engineer requires an additional test strip.

The cracked pavement shall be rolled to ensure that all pieces of cracked pavement are firmly seated against the subgrade. The rolling pattern shall be determined by the Engineer such that the passes overlap to ensure full coverage. No more than 5 one-way passes will be allowed per lane.

If traffic is allowed on the cracked pavement prior to seating, or on the cracked and seated pavement prior to placement of the first bituminous course, the Contractor shall maintain the pavement for traffic to the satisfaction of the Engineer. If the cracked and seated pavement is open to traffic for more than 7 calendar days prior to overlaying, the pavement shall be reseated with a single pass immediately prior to overlaying to the satisfaction of the Engineer.

The Contractor shall exercise cautions during all phases of construction to prevent damage to culverts. Crawl speed shall be maintained while crossing culverts or moving to position. No excessive turning movements will be allowed on the culverts and only one piece of construction equipment is to be allowed on culverts at one time.

Any soft areas that are observed during and after the rolling shall be removed and patched full-depth. After patching the pavement shall be swept clean of debris prior to priming and the placement of the first lift of bituminous concrete binder course.

PAVEMENT CRACKING AND SEATING (Continued):

Method of Measurement: Pavement cracking and seating will be measured in place and the area computed in square yards. The length shall be measured along the centerline of the surface excluding the omitted sections over drainage facilities.

Removal and replacement of soft areas will be measured as Class D patches as specified in Section 620 of the Standard Specifications.

Basis of Payment: Cracking and seating concrete pavement will be paid for at the contract unit price per square yard for PAVEMENT CRACKING AND SEATING which shall be payment in full for furnishing all labor, equipment, and incidentals necessary to acceptably crack and seat the existing portland cement concrete pavement as described herein, including coring as specified to determine the extent of the cracking.

The removal and replacement of soft areas as described herein will be paid for at the contract unit price per square yard for Class D Patches of the type and thickness specified as described in Section 620 of the Standard Specifications.

RUBBLIZING PORTLAND CEMENT CONCRETE PAVEMENT:

Description: Under this item, the Contractor shall rubblize and compact existing portland cement concrete pavement at the locations indicated on the contract plans or as ordered by the Engineer.

Construction Details:

Asphalt overlays shall be removed from the surface the site prior to rubblizing.

All loose joint fillers, expansion material or other similar debris shall be removed from the site.

When the area to be rubblized abuts concrete pavement which is to remain in place and unbroken, a transverse joint shall be saw cut full-depth.

Equipment: The existing pavement shall be rubblized with a self contained, self propelled resonant frequency pavement breaking unit capable of producing low amplitude, 2000 foot pound blows at a rate of 44 per second. The unit shall be equipped with a water system to suppress dust generated by the rubblizing operation. The operating speed of the unit shall be such that the existing pavement is rubblized, full depth, into particles ranging in size from sand to pieces not exceeding six inches in largest dimension, the majority being one to two inches in size. The desired breaking effort shall generally be accomplished in one pass of the breaking shoe.

RUBBLIZING PORTLAND CEMENT CONCRETE PAVEMENT (Continued):

Drainage - Prior to rubblizing the pavement, the required pipe underdrain system shall be completely installed and functioning.

Breaking Pattern - The breaking pattern shall proceed in a longitudinal direction, beginning at a free edge (shoulder or previously broken edge) and progressing toward the opposite shoulder.

In order to maintain traffic, if only a portion of the total pavement width is being rubblized and overlaid, rubblizing shall continue six inches beyond the anticipated overlay width.

Rubblizing shall continue in the next unbroken lane, at the edge of the unbroken pavement, and continue progressing toward the opposite shoulder. The rubblizing shall continue in this direction until the opposite shoulder is reached.

Rubblizing shall progress in the last lane until it is only one or two feet wide near the shoulder. This thin unsupported strip cracks into approximately one foot squares, which is acceptable in this area only. The above pattern shall be followed to insure leaving these larger pieces at the shoulder joint rather than along a longitudinal joint.

Reinforcing Mesh - Welded wire mesh reinforcement in rubblized pavement shall remain in place. However, any reinforcement exposed at the surface as a result of rubblizing and/or compaction operations shall be cut off flush with the surface and removed from the site.

Compaction - Prior to placing the initial asphalt overlay course, the rubblized pavement shall be compacted first with a pass of a steel wheel vibratory roller than with a pass of a rubber tired roller, then a pass of the vibratory roller. Immediately prior to paving, a fourth pass shall be made with the vibratory roller (one pass is up and back in the same path).

One inch or deeper depressions, that are present after rubblizing and/or compaction, shall be filled with Type CA-6 Course Aggregate. Filled depressions shall be compacted with the same roller and compactive effort previously described.

Traffic Protection - Traffic shall not be allowed on the rubblized pavement before the initial asphalt overlay course is in place, except at crossover and/or access points. In no instance shall more than 46 hours elapse between rubblizing the existing pavement and placing the initial asphalt concrete overlay course. However, in the event rain occurs between these operations, this time limitation may be waived to allow sufficient time for the rubblized pavement to dry out to the satisfaction of the Engineer. Crossover and/or access points shall be maintained in the same compacted state as non-accessible areas until the initial asphalt concrete overlay course is placed. Maintenance of crossover and/or access points shall be accomplished as ordered by the Engineer.

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RUBBLIZING PORTLAND CEMENT CONCRETE PAVEMENT (Continued):

Method of Measurement:

The quantity to be measured under this item shall be the actual number of square yards of existing Portland cement concrete pavement rubblized.

Basis of Payment: This work will be paid for at the contract unit price for RUBBLIZING PORTLAND CEMENT CONCRETE PAVEMENT, which price shall include the cost of furnishing all labor, materials and equipment necessary to rubblize, suppress dirt, fill depressions, remove exposed mesh and loose joint fillers or expansion material, compact and maintain the compacted condition of the existing pavement before the initial asphalt concrete overlay course is placed.

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