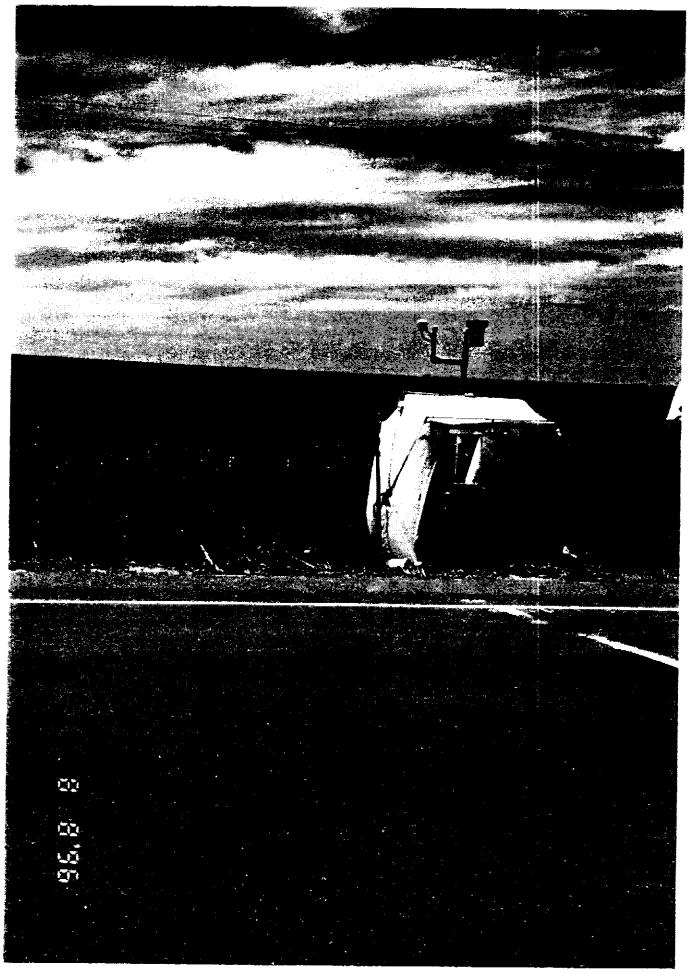
LTPP Seasonal Monitoring Program

Site Monitoring Suspension Status Draft Final Report for GPS Section 310114 (31A) Hebron, Nebraska



U.S. Department
of Transportation
Federal Highway
Administration

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ERES CONSULTANTS, INC.

Pavement Engineering Specialists
Research
Evaluation & Design Services
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September 11, 1996

Mr. Aramis Lopez
FHWA LTPP Technical Representative
Federal Highway Administration
LTPP Division, HNR-40
Turner-Fairbanks Highway Research Center
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McLean, Virginia 22101-2296

Reference: LTPP Seasonal Monitoring Program
Site Monitoring Suspension Report Status
for GPS Section 310114 (31A) Hebron, Nebraska
FHWA Contact DTFH61-96-C-00013
ERES Project No. 95-075-R1

Dear Mr. Lopez:

Find enclosed two copies of the draft final site monitoring suspension report for GPS section 310114 (31A), Hebron, Nebraska. The report contains information on instrument de-installation and monitoring data collection activities conducted on August 8, 1996. Please do not hesitate to contact me if you have any questions.

Sincerely,

Robert K. Kumapley

Seasonal Monitoring Program Coordinator
North Central Regional Coordination Office

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LTPP Seasonal Monitoring Program

Site Monitoring Suspension Status
Draft Final Report for
GPS Section 310114 (31A)
Hebron, Nebraska

Report No. FHWA-

Prepared by

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Prepared for

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September 1996

Technical Report Documentation Page

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15. Supplementary Notes

FHWA LTPP Technical Representative - Aramis Lopez, HNR-40

16. Abstract

This report contains information on instrument de-installation and monitoring data collection activities for the Long Term Pavement Performance (LTPP) General Pavement Study (GPS) section 310114 conducted on August 8, 1996. The report presents a description of the following activities: SMP data collection activities, including instrument and equipment problems noted prior to de-installation; instrument de-installation activities and unresolved problems with installed sensors; and instrument reinstallation schedule. Also included in the report are the color copies of site photographs taken during suspension preparation activities. The reinstallation of the instrumentation in this site is scheduled for August 8-15, 1997. All units such as the rain gauge, air temperature sensor, and the associated metal poles will be carefully reinstalled and tested.

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LTPP Seasonal Monitoring Program
Site Monitoring Suspension Status
Draft Final Report for
GPS Section 310114 (31A)
Hebron, Nebraska

1.0 INTRODUCTION

The seasonal monitoring data collection for the Long Term Pavement Performance (LTPP) General Pavement Study (GPS) section 310114 has been suspended for a period of one year effective August 8, 1996. The test section, which is part of the Seasonal Monitoring Program (SMP) managed by the Federal Highway Administration (FHWA) LTPP Division, is located 13 kilometers south of Hebron, Nebraska on the southbound driving lane of U.S. Highway 81. Additional background information on the test section, including the exact location of the test section, types of instruments installed, and the pavement structure in-place, can be found in the *Site Installation Report for GPS Section 310114 (31A), Hebron, Nebraska* dated February 1996 (1).

This report contains information on instrument de-installation and monitoring data collection activities conducted on August 8, 1996. After the installation of instrumentation in the test section on August 7, 1995, the test section was visited a total of nine times for SMP data collection, five times in 1995 and four times in 1996, including the de-installation visit. The dates and

activities performed during these visits can be found in the SMP data collection summary table in appendix A. The instrumentation for the site is scheduled for reinstallation August 1997 and will be monitored for another year. This section is planned to be monitored every other year for the remainder of the LTPP Study.

The report presents a description of the following activities: SMP data collection activities, including instrument and equipment problems noted prior to de-installation; instrument de-installation activities and unresolved problems with installed sensors; and an instrument reinstallation schedule. Also included in the report are color copies of site photographs taken during suspension preparation activities.

2.0 SMP DATA COLLECTION

2.1 SMP Data Collection

Prior to de-installation of the instrumentation in this test section, the full suite of SMP monitoring measurements in the *LTPP Seasonal Monitoring Program Instrument Installation and Data Collection Guidelines* (2) was performed. These include the following:

- FWD and associated measurements.
- Elevation survey.
- Manual distress survey with transverse profile measurements.
- Manual electrical resistivity measurements (two- and four-point).

- Automated mobile data measurements (Time Domain Reflectometry [TDR] and resistivity).
- Water table measurements.

A summary of all the SMP data collected to date can be found in the SMP data collection summary table in appendix A. The specific type and amount of data collected can be found in the SMP field activity report (data sheet SMP-D10) in appendix B. Ten other SMP data sheets pertaining to the data collection activities are also in appendix B. The locations for FWD, faultmeter, and elevation measurements can be found in the site information sheet (SIS) in appendix C. During the instrument de-installation and data collection activities, the weather was calm and sunny.

As can be seen the SMP data collection summary table in appendix A, no longitudinal profile measurements were recorded. This data will be collected at the first opportunity once the new longitudinal profile equipment is released for use or the old profile equipment is in working condition.

2.3 Instrument and Equipment Problems

The performance of all TDR, rain gauge, and Measurement Research Corporation (MRC) sensors in the test section were evaluated by reviewing the data from the onsite and mobile dataloggers using the SMPCheck program (3).

A review of the onsite data collected during this visit indicated that MRC sensor 1 did not function as expected from June 10 1996 through August 8, 1996.

As can be seen in the plot presented figure D-1 in appendix D, the temperatures recorded by MRC sensor 1 from June 10 through August 8, 1996 were between -200 and -250 °C. This indicates failure of the sensor. The temperature recordings from the remaining MRC sensors and air temperature measuring sensor appear reasonable and typical of temperatures at this time of the year.

As shown in photograph 1 in appendix E, the collector unit (funnel) of the rain gauge is intact and the precipitation data recorded by the datalogger in figure D-1 appear reasonable, suggesting the rain gauge is functioning as expected. No obvious problems were noted from the data recorded from June 10, 1996 through August 8, 1996.

A review of the data from the mobile datalogger indicates that the TDR sensors are functioning as expected. All the TDR traces, which can be found in figure D-2 in Appendix D, are typical for this site. The traces had the required characteristics that enable analysis. However, in the same figure, plot K indicates potential problems with the mobile unit, possibly the CRREL multiplexer. As can be seen in plot K, a value of -6999 was noted for locations 10 and 11, suggesting potential problems at these locations in the mobile unit. A review of data from previous visits indicates that this problem existed as early as March 11, 1996.

3.0 INSTRUMENT DE-INSTALLATION ACTIVITIES

3.1 Suspension Preparation and Repairs to Instrumentation Hole

As required by the LTPP Seasonal Directive SM-8 (3), on the last day of monitoring, the following site preparation activities were performed:

- Application of an electronics quality, anti-corrosion compound to the TDR and BNC connectors, electrical resistivity connector, and MRC temperature lead wires.
- Disconnection and removal of the panel board containing the Onsite CR10, power supply, terminal strip, and relay. A desiccant pouch with all wires and connectors was sealed in a plastic bag as shown in photograph 2 in appendix E.
- After completion of the final water table depth measurement, the end of the piezometer was sealed and marked for easy identification.
- The three temperature holes in the pavement were sealed with silicone after the final temperature readings.
- Locked cabinet.

Photograph 3 in appendix E shows the condition of the instrument panel which is considered good.

All units such as the rain gauge, air temperature sensor, and the associated metal poles were labeled "31SA" and carefully stored in the North Central Regional Coordination Office (NCRCO) for reinstallation. The union

was left onsite in the cabinet. A new air temperature sensor has been ordered to replace the one with wires that were damaged during de-installation. Photograph 4 shows the damaged electrical wires.

3.2 Unresolved Problems with the Installed Sensors

The unresolved problems at this site are associated with the MRC sensor 1 and the CRREL multiplexer in the mobile unit. Previous problem reports (PRs) on these cases namely NA-01, NC-08, and NC-15 submitted February 22, 1995, February 27, 1995 and October 13, 1995 (5), respectively were reviewed. These problems were resolved and required no immediate action at the time. A new problem report related to the CRREL multiplexer has been despatched to the other three Regional Coordination Offices, PCS/Law and the LTPP Division, HNR-40 of the FHWA.

3.3 Unique Site Features

This test section is the 10th SMP installation in the LTPP North Central Region. The MOBILE program used to collect data from the mobile datalogger has been modified to account for the nonstandard TDR cable lengths in this site. The program, which is referred to as "31SAMOB," enables the maximum and minimum points on the TDR traces to be captured.

4.0 INSTRUMENT REINSTALLATION

Reinstallation of the instrumentation in this site is scheduled for August 8-15, 1997. All units such as the rain gauge, air temperature sensor, and the associated metal poles labeled "31SA" are carefully reinstalled and tested.

At the SMPCheck meeting recently held in Champaign, Illinois it was discussed that solar panels would be installed at the SMP sites on top of the cabinets to prolong the life of the battery onsite. There are ongoing efforts to purchase these units.

5.0 SUMMARY

This report contains information on instrument de-installation and monitoring data collection activities for the Long Term Pavement Performance (LTPP) General Pavement Study (GPS) section 310114, conducted on August 8, 1996. The report presents a description of the SMP data collection activities including instrument and equipment problems noted prior to de-installation, instrument de-installation activities, unresolved problems with the MRC 1 sensor and the CRREL multiplexer in the mobile unit, and an instrument reinstallation schedule. Also included in the report are the color copies of site photographs taken during suspension preparation activities.

Reinstallation of the instrumentation at this site is scheduled for August 8-15, 1997. All units such as the rain gauge, air temperature sensor, and the associated metal poles will be carefully reinstalled and tested. This includes the

installation of solar panels on the cabinets to prolong the life of the battery onsite. There are ongoing efforts to purchase these units.

LIST OF REFERENCES

1. *LTPP Seasonal Monitoring Program Site Installation Report for GPS Section 310114 (31A) Enterprise, Kansas.* Federal Highway Administration, LTPP Division, HNR-40, Turner-Fairbanks Highway Research Center, McLean, Virginia. February 1996.
2. *LTPP Seasonal Monitoring Program: Instrumentation Installation and Data Collection Guideline.* FHWA-RD-94-110, Federal Highway Administration, LTPP Division, HNR-40, Turner-Fairbanks Highway Research Center, McLean, Virginia. April 1994.
3. SMPCheck, computer software version 2.4, prepared for The Federal Highway Administration, Pavement Performance Division, HNR-30, McLean, Virginia. August 1996.
4. Lopez, Aramis Jr. *Long Term Pavement Performance Directive for the Seasonal Monitoring Program: Directive Number SM-8, Suspension of SMP Site Monitoring Activities.* Federal Highway Administration, LTPP Division, Turner-Fairbanks Highway Research Center, McLean, Virginia. March 1995.
5. Padgett, Sherry. *Long Term Pavement Performance (LTPP) Monitoring Problem Report.* A nine page Facsimile Message from Jonathan Groegr, PCS/Law, Beltsville, Maryland to Thomas Wilson, ERES Consultants, Inc., Champaign, Illinois, August 29, 1996.

Appendix A - SMP Data Collection Summary Table

SMP DATA COLLECTION SUMMARY

31SA-310114, US-81 SB LANES, 8 MILES SOUTH OF HEBRON, NE.

		ONSITE Data			MOBILE Data		Manual Data								FWD Data				Distress		Profile		Comments
Date dd/mmm/yy	Visit ID	Pvmt. Temp.	Air Temp.	Rain	TDR	Frost Volts	Backup TDR	Backup TDR	Frost 2-Pt.	Frost 4-Pt.	Water Table	Pvmt. Elev.	Joint Open.	Joint Fault	Man. Temp.	OWP	ML	PE	M	P	P	D	
21-Jul-95															X	1	1						FWD PRIOR TO INSTALLATION
1-Aug-95																			X		X		
7-Aug-95	95A														X	1	1						INSTALLATION
8-Aug-95	95B	X	X	X	X	X			D	D	D	D			X	3	3						
20-Sep-95	95C	X	X	X	X	X			D	D	D	D			X	2	2						
17-Oct-95	95D	X	X	X	X	X			D	D	D	D			X	3	3						
1-Nov-95																					X		
15-Nov-95	95E	X	X	X	X	X			D	D	D	D			X	3	3						CHANGED TIME TO CST
12-Dec-95	95F	X	X	X	X	X					D				X	3	3						
23-Jan-96	96A	X	X	X	X	X			D	D	D					0	0						NO TRAFFIC CONTROL, TOO COLD
7-Mar-96	96B	X	X	X	X	X			X	X	X					0	0		X				TOO COLD FOR FWD, RAIN FUNNEL GONE,MRC ?
24-Apr-96	96C	X	X	X	X	X			X	X	X	X			X	3	3		X				DISTRESS DIPSTICK ONLY, SET CLOCK TO DST
8-Aug-96	96D	D	D	D	D	D			D	D	D	D			X	4	4		X				DE-INSTALLED SITE

Updated August 29, 1996

N:\LTPP\NCRCO\TASK_A\SMP\SLOOP\SMPTRK\31SA.XLS

Appendix B - SMP Data Sheets

- SMP-D10: SMP Field Activity Report
- SMP-D03: Contact Resistance Measurements
- SMP-D04: Four-Point Resistivity Measurements
- SMP-D05: Ground Water Table Measurement
- SMP-D08: Elevation Measurements - AC
- SMP-M1: Distress Survey of Instrument Area
- FHWA/SHRP-LTPP Pavement Temperature Profile Measurements
- FASTBACK PLUS - Backup History Report

S 96

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-D10 SMP Field Activity Report	Agency Code [ ] LTPP Section ID [ ]

Onsite Datalogger and Instrumentation		
File Name - *.ONS 31SA96DH	[illegible]	Comments: #1 Thermister failure ← Day 162 fail
Battery Replace	Yes - (No)	Voltages 12.4
Repairs/Calib.		
Other:		

Mobile Datalogger		
File Name - *.MOB	31SA96DH	Comments: 10th & 11th readings on frost prone sec-6999
TDR/Resistance Voltages	Sets (0-2)	
Other:		

Manual Data Collection		
Piezometer	(Yes) - No	Comments: 4.068 m
Resistance 2 pt.	Sets (01)	
Resistivity 4 pt.	Sets (01)	
Elevations	Sets (01)	
Distress Survey	(Yes) - No	
Long. Dipstick Profile	(Yes) - No	
Photos or Video	(Yes) No	
Other:		

FWD and Associated Data		
FWD Testing	Sets (04)	Operator: GFE
JCP - Snap Rings	Sets ~~(N/A)~~	
JCP - Faulting	Sets (N/A)	
Other:		

IF REQUIRED, ATTACH SKETCHES TO THIS DATA SHEET

Comments: ~~Thermister~~ Accidentally cut Air Temp. wire. Repair before re-installation (purchase most likely) ← check on splicing w/resistor. Also union left inside cabinet

Prepared by: [illegible] Employer: EPES

Date (dd/mmm/yy): 21 [illegible] 96 Daylight Savings Time (Y or N): Y (Winter is standard time!)

31SA96D

LTPP Seasonal Monitoring Program Data Sheet SMP-D03 Contact Resistance Measurements	Agency Code [31] LTPP Section ID [0114]

Start Time (military): 0940

Test Position	Switch Settings I1 V1	Switch Settings I2 V2	Voltage (ACV) Range Setting	Voltage (ACV) Reading	Current (ACA) Range Setting	Current (ACA) Reading	Comments
1	1	2	V	9.92	micro Amps	133.1	current kept jumping
2	2	3		8.~~78~~		165.2	
3	3	4		8.89		123.9	
4	4	5		8.67		71.4	
5	5	6		4.22		132.4	
6	6	7		1.793		154.9	
7	7	8		1.449		146.8	
8	8	9		1.031		132.2	
9	9	10		2.025		130.6	
10	10	11		1.312		132.2	
11	11	12		1.075		135.2	
12	12	13		.972		144.8	
13	13	14		.973		125.3	
14	14	15		1.137		142.9	
15	15	16		1.049		152.5	
16	16	17		1.026		153.4	
17	17	18		1.226		140.2	
18	18	19		1.055		149.0	
19	19	20		1.153		136.0	
20	20	21		1.339		138.3	
21	21	22		1.318		126.2	
22	22	23		1.353		139.5	
23	23	24		1.103		142.7	
24	24	25		1.069		183.0	
25	25	26		1.182		187.1	
26	26	27		1.132		196.7	
27	27	28		1.483		174.4	
28	28	29		1.320		199.9	
29	29	30		1.165		134.3	
30	30	31		2.080		135.0	
31	31	32		1.215		181.0	
32	32	33		1.374		187.9	
33	33	34		1.401		192.2	
34	34	35		1.691		143.4	
35	35	36	↓	2.219	↓	135.1	
36	36	37	milli Volts	2.8	milli Amps	3.60	R1 = 0.77 Ω
37	37	38	micro Volts	313.2		3.09	R2 = 101 Ω
38	38	39	Volts	1.732	↓	1.72	R3 = 1006 Ω
39	39	00	" "	6.23	micro Amps	7.1	R4 = 877465 Ω

Note: R = V/I, in ohms; measured resistances should be compared with known values.

Comments: _____

Prepared by: DSP Employer: ERES Consultants, Inc.

Date (dd/mmm/yy): 08/AUG/96

3 1 5 A 4 0 2

LTPP Seasonal Monitoring Program Data Sheet SMP-D04 Four-Point Resistivity Measurements	Agency Code 32 LTPP Section ID 0114

Start Time (military): 0955

Test Position	Switch Settings				Voltage (ACV)		Current (ACA)		Comments
	I1	V1	V2	I2	Range Setting	Reading (Volts)	Range Setting	Reading (Amps)	
1	1	2	3	4	Milli	274.5	Micro	25.2	
2	2	3	4	5	Volts	.424		28.2	
3	3	4	5	6	↓	.408		30.9	
4	4	5	6	7	Milli	66.0		31.0	
5	5	6	7	8		53.9		57.7	
6	6	7	8	9		52.4		72.3	
7	7	8	9	10		53.6		61.7	
8	8	9	10	11		45.6		61.6	current all over
9	9	10	11	12		47.8		59.4	
10	10	11	12	13		38.7		73.3	
11	11	12	13	14		37.8		62.1	
12	12	13	14	15		43.4		73.5	
13	13	14	15	16		40.3		60.8	
14	14	15	16	17		42.2		67.0	
15	15	16	17	18		43.1		69.1	
16	16	17	18	19		48.5		77.7	
17	17	18	19	20		40.3		63.8	
18	18	19	20	21		46.6		67.3	
19	19	20	21	22		42.3		62.5	
20	20	21	22	23		43.4		67.8	
21	21	22	23	24		39.6		58.8	
22	22	23	24	25		41.4		78.9	
23	23	24	25	26		36.6		66.4	
24	24	25	26	27		48.9		80.2	
25	25	26	27	28		56.3		76.2	
26	26	27	28	29		76.8		75.2	
27	27	28	29	30		55.1		66.0	
28	28	29	30	31		57.8		80.5	
29	29	30	31	32		42.7		77.7	
30	30	31	32	33		37.8		71.9	
31	31	32	33	34		53.4		75.1	
32	32	33	34	35		57.8		78.6	
33	33	34	35	36	↓	62.3	↓	79.3	
36	36	36	37	37	Milli	2.5	Micro	3076	R1 = .81Ω
37	37	37	38	38	↓	272.9		2682	R2 = 101.7Ω
38	38	38	39	39	volts	1.683		1617	R3 = 1003Ω
39	39	39	00	00	volts	6.21	↓	000.7	R4 = 887143Ω

Note: R = V/I, in ohms; measured resistances should be compared with known values.

Comments: _____

Prepared by: GAM Employer: ERES

Date (dd/mmm/yy): 08/AUG/96

21SA96D

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

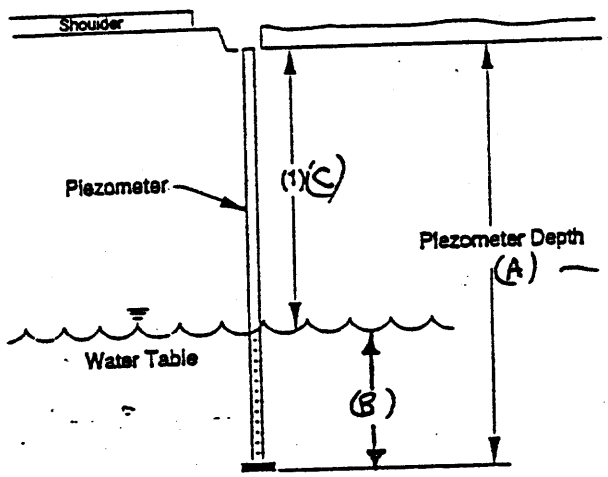
LTPP Seasonal Monitoring Program Data Sheet SMP-D05 Ground Water Table Measurement	Agency Code [37] LTPP Section ID [0114]

MEASURED
Piezometer Depth (m): (A) 4.285

Measurement Number	Time (military)	(C) Depth to Water[1] (m) (A−B)	(B) Depth of Water (m) measure	Comments
1	0855	4.068	0.217	4.068
2	1430	4.055	0.230	

[1] Distance from top of piezometer pipe to top of ground water table; to an accuracy of ±10 mm (0.4 in)

[2] If piezometer pipe is dry or frozen, enter "time" when observation was made, leave "depth to water" field blank, and enter "pipe is dry" or "pipe is frozen" under comments column.



MEASURE! DO NOT ASSUME DEPTH ON INFO SHEET IS CORRECT - RV

Comments: _____

_____

_____

Prepared by: GAM Employer: ERES

Date (dd/mmm/yy): 08/AUG/96

31 S A 96 D

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-D08 Elevation Measurements - AC	Agency Code [31] LTPP Section ID [0114]

Type of Instrument: NA2000

Start Time (military): 1055

check "close" at midpoint of survey

BM	Station	BS	HI	~~IFS~~ +	FS	ELEV	CLOSE
Piez.	0+00	1.3350		1.3348			1.3352
D.O.T. BM Other	N/A	N/A					N/A

Station	Offset (PE): ___.___ m	Offset (OWP): ___.___ m	Offset (ML): ___.___ m	Offset (IWP): ___.___ m	Offset (ILE): ___.___ m	Comments
0-20	1.1199	1.1219	1.0945	1.0912	1.0793	
0-10	1.1215	1.1186	1.0952	1.0900	1.0789	Marcaus
0-05	1.1193	1.1223	1.0935	1.0902	1.0760	
0+00	1.1205	1.1215	1.0955	1.0908	1.0774	
0+25	1.1200	1.1220	1.0971	1.0916	1.0813	
0+50	1.1245	1.1272	1.1029	1.1020	1.0918	
0+75	1.1295	1.1341	1.1083	1.1036	1.0924	
1+00	1.1379	1.1387	1.1133	1.1088	1.0986	
1+25	1.1359	1.1367	1.1122	1.1079	1.0985	
1+50	1.1448	1.1441	1.1204	1.1148	1.1018	
1+75	1.1431	1.1391	1.1177	1.1108	1.1005	
2+00	1.1431	1.1436	1.1187	1.1119	1.1017	

Comments: Conditions?

Prepared by: GAM Employer: ERES

Date (dd/mmm/yy): 08/AUG/96

31 L S A 96 D

LTPP Seasonal Monitoring Program Data Sheet SMP-M1 (Page 1) Distress Survey of Instrumentation Area	Agency Code [31] Test Section Number [0114]

Rate the condition of the instrumentation area (check one):

X Good (little or no distress; repairs are not required in the immediate future)

___ Poor (significant distress, repairs required now or in the immediate future)

List any repairs (type and extent) done since instrumentation installation and/or last survey of instrumentation area: No Repairs done since installation

Additional Comments: Significant rutting in test section possible ponding and eroded soil on shoulder. Candidate for rehab/maintenance. Call DOT regarding these issues.

Prepared by: DSP Employer: ERES Consultants

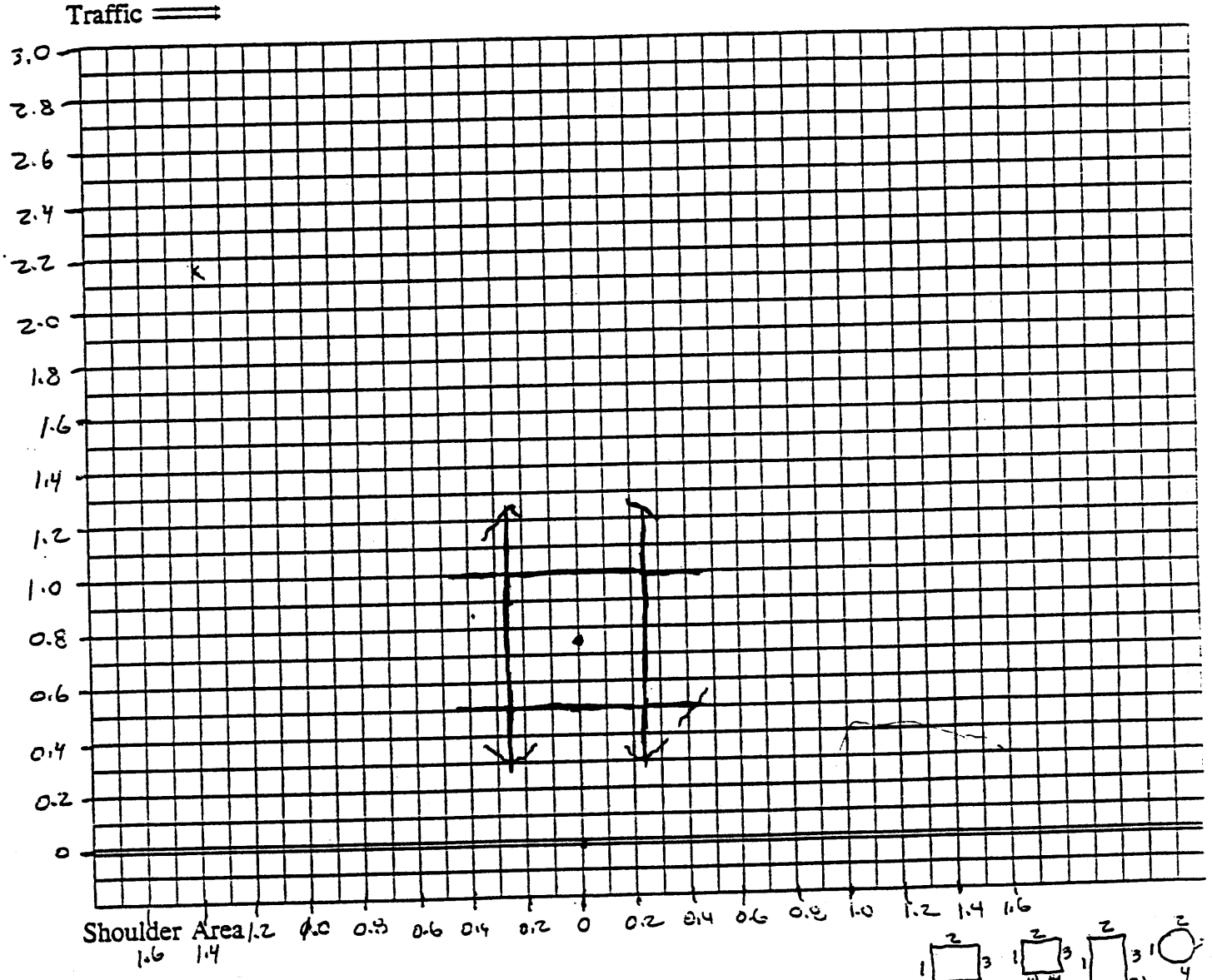
Date: 08/AUG/96
dd-mmm-yy

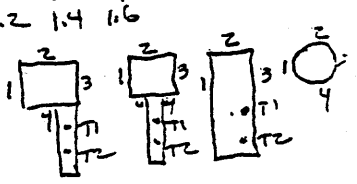
3 1 S A 9 6 0

LTPP Seasonal Monitoring Program Data Sheet SMP-M1 (Page 2) Distress Survey of Instrumentation Area	Agency Code [31] SHRP Section ID [0 1 1 9] Survey Date [08 AUG 96] dd mmm yy

Use grid below to sketch distresses within 1.5 m (5 ft) of instrumentation block/hole and trench. Use LTPP Distress Identification Manual to extent possible. (Note: each square in grid equals 0.1 m by 0.1 m area)

Traffic ⟹





Use table below to record settlement of pavement in instrumentation area.

Measurement Device: DIPSTICK / STRAIGHT EDGE

Location	Settlement, mm			
	Location 1	Location 2	Location 3	Location 4
Instrumentation block/hole	0.1	-1.1	0.1	-1.1
Trench	N/A	N/A	n/a	n/a

SHRP LTPP

SHRP REGION NCR STATE CODE 31 SHRP ASSIGNED ID 31014

STATE NE TESTING SMP FWD DISTRICT NE DOT

LTPP EXPERIMENT CODE SMP FWD ROUTE/HIGHWAY NO. US-81

FIELD ACTIVITY REPORT FIELD SET NO. SMP96D

TESTING DATE 08/Aug/96 (dd mmm yr) SHEET NUMBER 1 OF 3 DOG SHEET

FWD AND TOW VEHICLE BEFORE OPERATION CHECKS _____ (Initial)

	TIME	ODOMETER
START TRAVEL	~~7:30~~ 0730	57000.8
END TRAVEL	~~7:40~~ 0740	57008.3
READY TO TEST	~~8:30~~ 0830	
TRAFFIC CONTROL READY	~~8:15~~ 0815	
BEGIN TESTING	~~8:30~~ 0830	
END TESTING	~~3:25~~ 1525	
START TRAVEL		57010.4
END TRAVEL		

DOWN TIME _____ HOURS REASON(S) _____

NUMBER OF TESTS:

	BASIN	JT/CRACK
TP	0	
OWP	Cycles = 9 * 11 = test/cycle	0
PE	0	
ML	4 * 10	

ADDITIONAL REMARKS REGARDING TESTING _____

TRAFFIC CONTROL CREW

AGENCY NE DOT

NAMES: _____

TEST COMPLETED ERES (AFFILIATION) GFE (FWD OPERATOR) 08 (dd) Aug (mmm) 1996 (YEAR)

COPIES: RCO

FHWA/SHRP-LTPP PAVEMENT TEMPERATURE PROFILE MEASUREMENTS

SHRP NORTH CENTRAL REGION

SHRP SECTION I.D. # [illegible]

AGENCY NC DoT

TESTING SMP FWD

ROUTE/HIGHWAY # I-81 SB

FIELD SET # SMP96 D

TESTING DATE dd/mmm/yr 08/Aug/96

SHEET # 2 OF 3

LOCATION STATION 0-03

DEPTH	D1 = 1.0	D2 = 3.9	D3 = 6.8	D4 =	D5 =	WEATHER
MIL.TIME	T1 (F)	T2 (F)	T3 (F)	T4 (F)	T5 (F)	CONDITIONS
08 42	75.3	75.8	89.9			PC
09 40	~~82~~ 82.7	81.8	81.5			S
10 36	91.7	89.7	83.9			S
11 41	100.1	94.3	87.1			S
12 40	110.6	102.9	91.4			S
13 43	116.1	107.9	96.0			S
14 45	118.4	112.5	99.0			S
15:17	120.6	113.3	100.1			

NOTE: USE ONLY THESE WEATHER TERMS; (S)SUNNY, (PC)PARTLY CLOUDY, (C)CLOUDY, (R)RAIN

COMMENT

TESTING COMPLETED BY:

GFE
FWD OPERATOR

dd/mmm/yr
08/Aug/1996
DATE

FHWA FWD S/N 8002-060

FASTBACK PLUS BACKUP HISTORY REPORT 08-08-96 15:30:56

```
SU  User name       = HI_DISK
SN  Set name        = C9608088.FUL
SV  Volume          = C:
SY  Volume type     = Fixed Disk
SI  Comment         = ""
SM  Media           = A:MS-DOS 1.44Mb 3 1/2 Floppies
SD  Date gates      = Off :  01-01-80  12-31-99
SR  Size gates      = Off :          0  2146435072
SA  Attributes      = Off :  None
SE  ECC             = On
SC  Compression     = Save Time
    Virus Scanning  = Off
ST  Backup Type     = Full
SP  Protection      = NONE
```

	FILE NAME	SIZE	DATE	TIME	ATTR	SEG	ENGBLK
P	PATH = \						2
P	PATH = \FWD						2
P	PATH = \FWD\DATA						2
F	31SA96D1.FWD	2243930	08-08-96	14:42:00	----	1	2
F	31SA96D3.FWD	2294770	08-08-96	15:17:20	----	1	53

31SA96D1 8:29 Sta 10, DMI should be -10
Comment: Subjected to instrumentation hole. (Delete existing comment)

~~31SA96D3 9:52A Sta 100, Paper jammed in printer~~

31SA96D1 10:43A Sta 75, Repeat test due to variations

31SA96D3 11:15A Sta -25, DMI should be -20

11:19A Sta -5, DMI should be +0

31SA96D1 1:03P Sta 125, Repeat test due to variations

31SA96D1 2:03P Sta 150 Repeat test due to variations

add comment

Appendix C- Site Information Sheet (SIS)

Updated September 11, 1996

310114 -31SA

LOCATION - US-81 SB Lanes, 8 Miles South of Hebron, NE
CONTACTS - Al Horak (402) 362-5930 (second contact is Bill Parrish ((308)) 385-6265)
TEMP HOLES - Sta 0-03, Depths about 1.0", 3.9", and 6.8" (AC = 8.25").

DISTRESS COMMENTS:

Sta F1 - Tests at -10, and at 25 foot intervals from Sta 0+00 to Sta 2+00.

-10 LP ADJACENT TO INSTRUMENTATION HOLE

Sta F3 - Tests at -20, -5, and at 25 foot intervals from Sta 0+00 to Sta 2+00.

PIEZOMETER - Sta 0+99.5, 1.0 feet from edge of paved shoulder, Depth = 4.285 M.

ELEVATIONS - No DOT BM.

Offsets:	PE	OWP	ML	IWP	ILE		
(M)	-0.16	0.16	0.76	1.83	2.90	3.51	3.81
(ft)	-0.5	0.5	2.5	6.0	9.5	11.5	12.5
	(nail)	dimp	dimp	dimp	dimp	dimp	(nail)

Note: Offsets are based on 12'3' lane using the edge of the stripe.

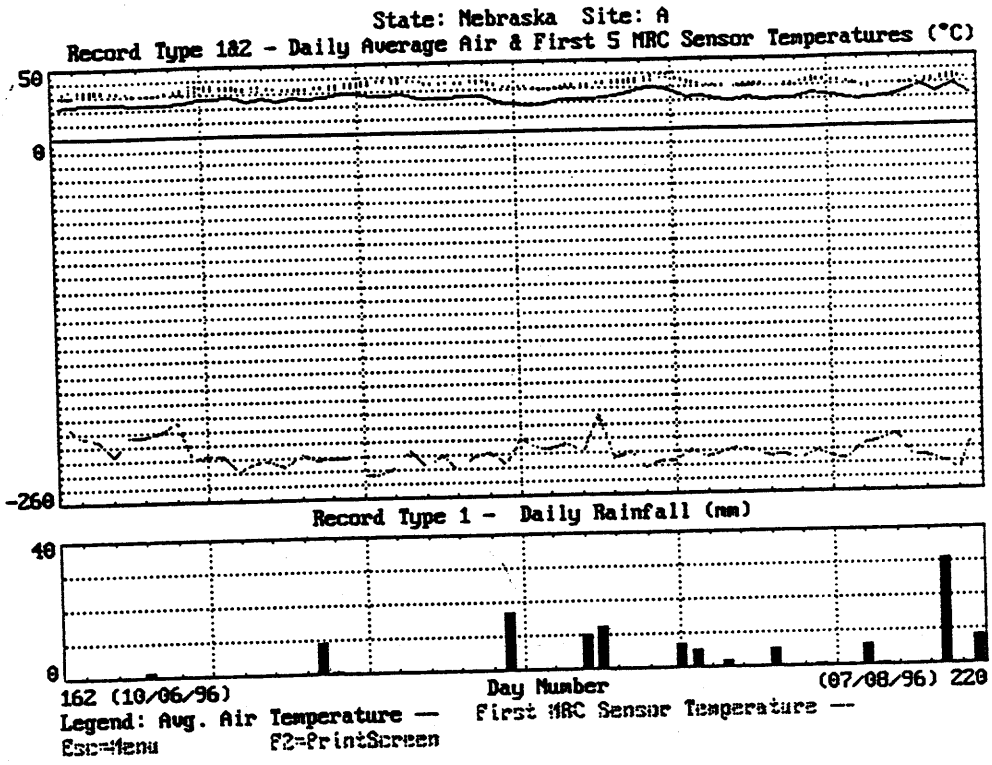
Note: PK nails are 13 feet apart and elevations between nails are at 1.0'(LE), 3.0'(WP), 6.5'(ML), 10.0'(WP), and 12.0'(LE). Latest guidelines require nails be 0.5 feet outside the section.

Sta: Transverse profiles at -20, -10, -5 and every 25 feet from Sta 0+00 to Sta 2+00.

COMMENTS
- use **31SAMOB vs MOBILE program** - cable lengths 18.90 and 20.85
- MRC sensor 1 failed ?
- Wayfare Motel (402-768-7226) - in Hebron just south of DOT yard
  Rosewood Villa (402-768-6524) - in Hebron 0.5 blocks south of DOT

Appendix D - Instrument and Equipment Evaluation Plots

- MRC Sensor Profiles (figure D-1)
- TDR Traces (figures D-2)



MRC 1 Failure

Figure D-1. Profiles for the first five MRC sensors for test section 31SA for the period of June 10, 1996 to August 27, 1996.

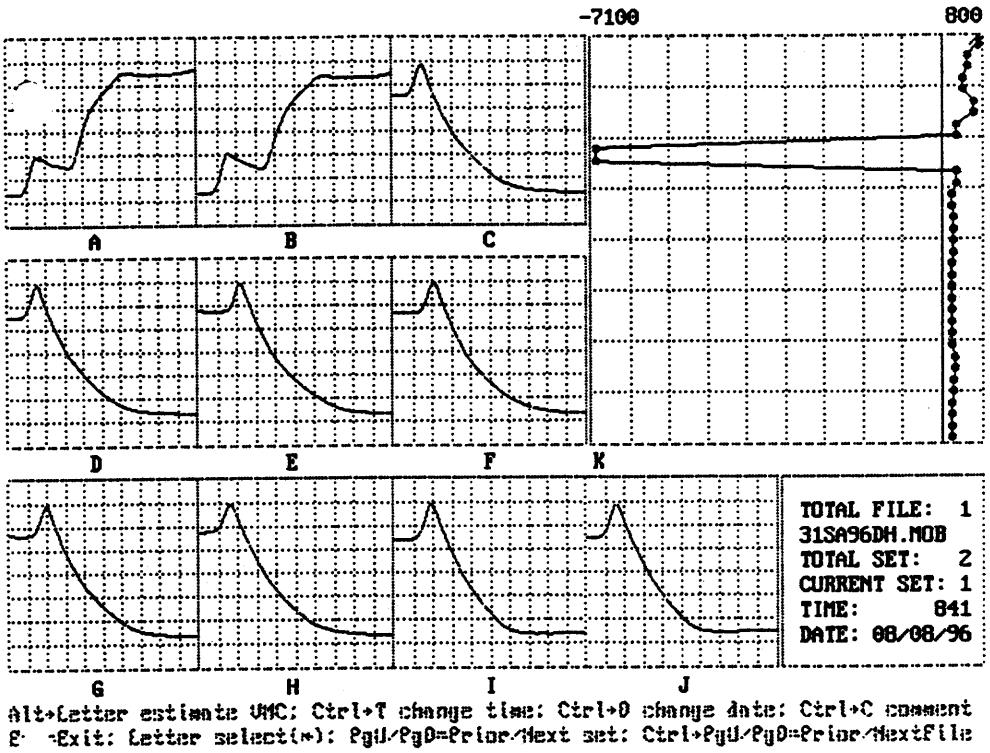
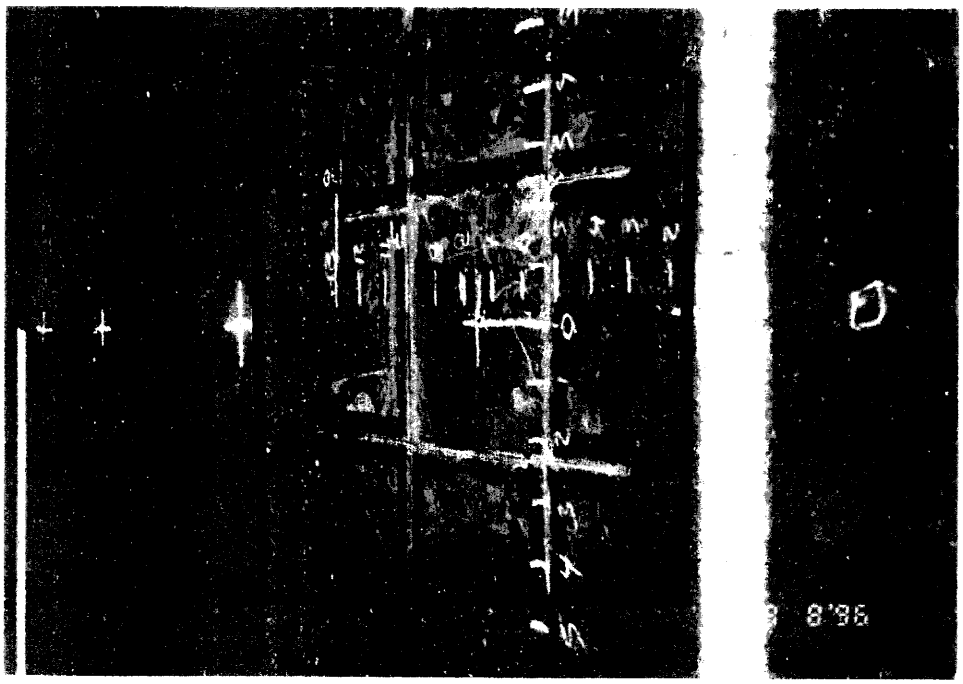


Figure D-2. TDR traces for test section 31SA recorded at 8:41am on August 8, 1996.

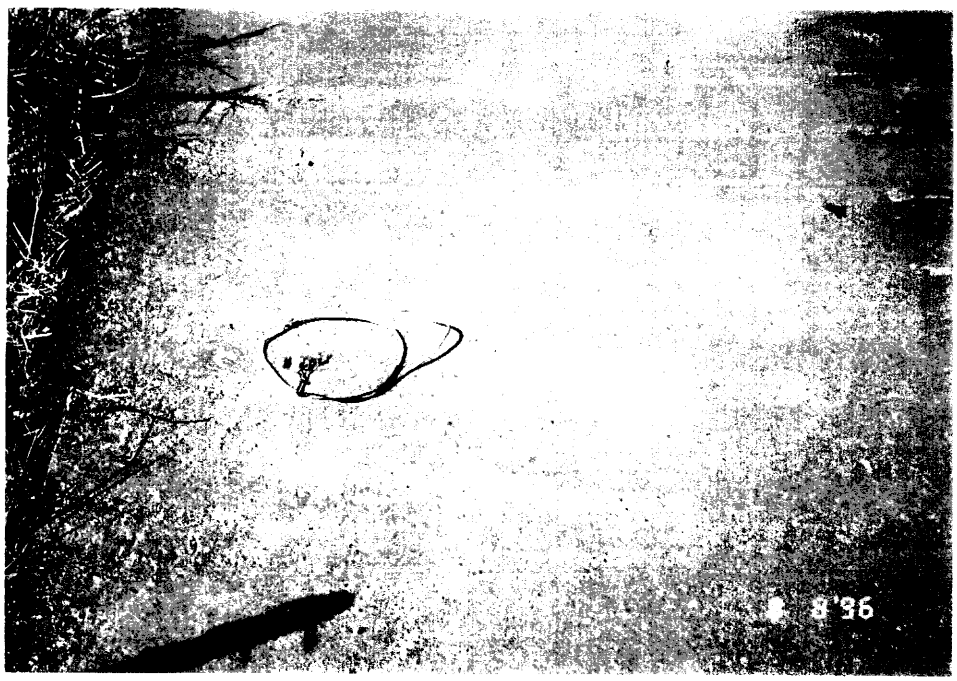
Appendix E - Photographs

Photograph #1

Photograph # 2



Photograph # 3



Photograph # 4