LTPP Seasonal Monitoring Program

Site Installation Report for GPS Section 313018 (31B) Kearney, Nebraska

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Report No. FHWA- February 1996

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Report No. FHWA-

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February 1996

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
FHWA-		

4. Title and Subtitle	5. Report Date
LTPP Seasonal Monitoring Program Site Installation Report for GPS Section 313018 (31B) Kearney, Nebraska	February 1996
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
Robert J. Van Sambeek and Ronald R. Urbach	DBNX92700-B6-31B

9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Braun Intertec Corporation 6875 Washington Avenue South, P.O. Box 39108 Minneapolis, Minnesota 55439-0108	11. Contract or Grant No. DTFH61-92-C-00009

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
Federal Highway Administration LTPP-Division, HNR-40 Turner-Fairbanks Highway Research Center 6300 Georgetown Pike McLean, Virginia 22101-2296	Final Report August 1995 - January 1996
	14. Sponsoring Agency Code

15. Supplementary Notes
Contracting Officer's Technical Representative - Aramis Lopez, HNR-40

16. Abstract
This report contains instrumentation installation details and data collection summaries for GPS test section 313018, which is a core section in the LTPP Seasonal Monitoring Program. This jointed plain concrete (JPC) pavement section on Interstate Highway 80 east of Kearney, Nebraska was instrumented August 10, 1995. Instrumentation included time domain reflectometry (TDR) probes to estimate moisture content in unbound pavement layers, thermistor probes to measure pavement structure thermal gradients and air temperature, electrical resistivity probe to predict frost/thaw conditions, piezometer to measure water table depth below the pavement surface, snap rings to measure joint opening, and tipping-bucket rain gauge to measure precipitation.

Monitoring data was collected the day after instrument installation and roughly on a monthly basis from August 1995 to January 1996, and data collection is expected to continue through July 1996 to complete the current monitoring cycle. In addition to temperature and precipitation data that are collected continuously by a datalogger at the site, monitoring data each month usually includes Falling Weight Deflectometer data, joint faulting data, joint opening data, TDR probe readings, frost/thaw readings, and piezometer readings. On a less regular basis, longitudinal profile data, pavement surface elevation data, and manual distress data are collected as required by FHWA guidelines. A summary of data collected is included in the report.

17. Key Words	18. Distribution Statement
Long Term Pavement Performance, LTPP, Pavement Instrumentation, Seasonal Monitoring Program, SMP, Time Domain Reflectometry, TDR, Resistance, Frost, Thaw, Temperature, Thermistor, Water Table, Piezometer, Falling Weight Deflectometer, FWD, Joint Faulting, Joint Opening	

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price

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LTPP Seasonal Monitoring Program
Site Installation Report for GPS Section 313018 (31B)
Kearney, Nebraska

I. Introduction

This report contains information specific to instrument installation and monitoring data collection for the Long Term Pavement Performance (LTPP) General Pavement Study (GPS) section 313018, which is part of the core Seasonal Monitoring Program (SMP) under the Federal Highway Administration (FHWA) LTPP Division. This pavement section was instrumented on August 10, 1995, and will have regular data collection through July 1996. The section will be monitored every other year under the LTPP Study for a ten-year period or until it is removed from the study.

A. Test Site Location

GPS section 313018 is located about 1.5 kilometers east of Kearney, Nebraska on the westbound driving lane of Interstate Highway 80 at milepost 274.5.

B. General Test Section Information

This four-lane divided highway had the original 305-mm thick jointed plain concrete (JPC) pavement placed in 1985. The rest of the pavement structure consists of a 140-mm thick soil cement base on a coarse-grain subgrade. Additional background information about the section is located in Appendix A-1. This information includes, but is not limited to, the following items:

- SMP location map;
- Detailed section location map;
- SHRP Inventory Data Sheet - traffic, design factors, and layer information;
- SHRP Section Field Verification Form;
- IMS L05A and L05B tables - layer thickness and material type; and
- LTPP Form S04 - base and subgrade moisture data.

Relevant pre-installation monitoring data for the section located in Appendix A-2 includes the following:

- Pre-installation pavement distress data;
- Pre-installation FWD data (includes tests outside the section limits); and
- FWDCHECK program uniformity analysis results.

C. SMP Test Section Information

The geographic location and existing pavement structure place this section in Cell 23 of the SMP experiment, which is defined by the following parameters:

- JPC pavement;
- Coarse-grain subgrade;
- Freezing environment; and
- Dry environment.

This was the eleventh SMP installation in the LTPP North Central Region, and highlights of the installation are summarized in Section IV of this report. Data forms from the LTPP Seasonal Monitoring Program: Instrumentation and Data Collection Guidelines, April 1994, were used for this installation, and the people involved with the installation are listed on "Data Sheet SMP-I01: List of Installed Instrumentation," which is included in Appendix C-1 along with the other SMP installation forms.

II. Instrumentation Installation

A. Pre-Installation Activities

Mr. George Woolstrum and Mr. Thomas Wais of the Nebraska Department of Roads (Department of Roads or referred to as "the agency" in this report) were initially contacted regarding potential sections identified for the seasonal monitoring pilot activities started in 1991 under the Strategic Highway Research Program (SHRP). General Pavement Study (GPS) section 311030 was included in the pilot study, and falling weight deflectometer (FWD) data were collected on that site from the fall of 1991 through the spring of 1992 on roughly a monthly basis as weather permitted. Data analysis results from the SHRP SMP pilot were published in Transportation Research Record Number 940903.

In 1993, Mr. Woolstrum was contacted to confirm continued agency support for GPS section 311030 as a core section in the SMP study administered by the FHWA LTPP Division. In addition, SPS section 310114 and GPS sections 313018 and 313023 were identified as potential core sections. The agency was willing to support two sections, and SPS section 310114 and GPS section 313018 were selected. The agency agreed to defer any pavement rehabilitation at least the five years required to get three years of monitoring data that is collected every other year. The agency could not guarantee deferred rehabilitation for the asphalt surface placed in 1982 on GPS section 311030, which had been in the SHRP SMP pilot testing. Also, manual distress data for GPS section 313023 includes map cracking on the concrete pavement surface which made GPS section 313018 a better choice.

On July 20, 1995, a pre-installation meeting was held in Lincoln, Nebraska for agency staff involved with instrumentation installation and monitoring activities for both SPS section 310114 and GPS section 313018. A presentation was given on the SMP, arrangements were made for the agency to supply equipment and materials required for the installation, and installation dates were set for agency staff to verify availability of equipment and materials. The agenda, list of participants, and notes from the pre-installation meeting are included in Appendix B-1. For GPS section 313018, the following installation modifications were discussed at the meeting:

- The agency indicated the piezometer would have to be installed through a hollow-stem auger because the saturated sandy/gravel soils would cave in when the auger was removed from the hole. The agency agreed to provide a PVC piezometer compatible with the hollow-stem auger on the drill rig.

- RCO staff requested that the agency install a frost-free benchmark at the site because the PVC piezometer would not be protected from frost heave.

- The agency was not willing to cut the conduit trench across the concrete shoulder. As an alternative, the agency elected to hire a horizontal boring contractor to install a conduit from the ditch to the instrumentation hole.

- The agency did not have equipment that could saw or core the 330-mm depth required, and they agreed to hire a contractor to core the instrumentation hole through the concrete surface.

After the pre-installation meeting, RCO staff stopped at GPS section 313018 to identify any installation concerns with the site and to select which end of the section to monitor. Field notes from the site visit are included in Appendix B-1. Also, pre-installation monitoring activities for GPS section 313018 included FWD testing and a manual distress survey both completed on April 19, 1995.

At the RCO, pre-installation activities included performing instrumentation checks/calibrations, and incorporating improvements to the installation process based on previous installations done in 1993 and 1994. Recommended improvements to the installation process resulting from instrumentation of GPS section 313018 are listed in Section IV of this report, and results from instrumentation checks/calibration are included in Appendix B-2 using the following forms:

- Data Sheet SMP-C01: TDR Probe Check;
- Data Sheet SMP-C02: Thermistor and Air Temperature Probe Check;
- Data Sheet SMP-C03: Electrical Resistivity Probe Check;
- Data Sheet SMP-C04: Function Generator, Multi-meter, and Switch Box Checks; and
- Data Sheet SMP-C05: Tipping-Bucket Rain Gauge Calibration.

For the air temperature and thermistor probes, checks were done using the datalogger to monitor the 19 temperature readings for the two probes simultaneously for tests run in an environmental chamber for about 12 hours at both 1.7°C and 38.9°C. The probes were left connected to the datalogger for several days after the check to verify their continued operation and consistency among the 19 temperatures recorded. The tipping-bucket rain gauge was also calibrated during this time period with data stored on the datalogger.

For the resistivity probe, loose electrode wraps were tightened by twisting the lead with a needle-nose pliers, and lead wires sticking out of the potting material for the probe were covered with silicon sealant for protection during installation. Excess potting material was scraped off the electrodes for better contact with the soil.

Pre-installation activities also required selection of the instrumentation location. From field observations during the July 20, 1995 site visit and FWDCHECK program analysis for the section, the five panels from Station 0-31 to Station 0+50 were selected for monitoring, and instrumentation would be placed at Station 0-22, based on the following items:

- The datalogger cabinet and the SHRP section markers would be farther apart to allow the 4.3-m wide mower used by the agency to go between the two obstructions;
- The influence of trees along the highway at Station 5+00 would be avoided; and
- Modulus of subgrade reaction was more uniform compared to the degree of variation for the five panels at Station 5+00.

B. Installation Activities

The SMP instrumentation installation itinerary for Nebraska included travel, installation, and data collection time for two sites over a one-week period. From August 6, 1995 through August 8, 1995, RCO staff traveled to Hebron, Nebraska, and completed SMP activities on SPS section 310114. On August 9, 1995, RCO staff traveled to Kearney, Nebraska and visited GPS section 313018 to verify

installation details for the next day. Agency staff were at the site completing installation of three benchmarks, with one of the benchmarks located at Station 0+31 and offset -20.8 m from the driving lane. Information on the three benchmarks is included in Appendix C-1.

Instrumentation installation was completed at GPS section 313018 on August 10, 1995. Some final installation activities continued on the following day. The following installation forms are included in Appendix C-1 along with field notes and photographs of the installation:

- Data Sheet SMP-I01: List of Installed Instrumentation;
- Data Sheet SMP-I02: Instrumentation Locations;
- Data Sheet SMP-I03: Log of Piezometer Hole;
- Data Sheet SMP-I04: Log of Instrumentation Hole;
- Data Sheet SMP-I05: Field Gravimetric Moisture Contents;
- Data Sheet SMP-I05(A): Lab Gravimetric Moisture Contents;
- Data Sheet SMP-I05(B): Gravimetric Moisture Comparison;
- Data Sheet SMP-I06: TDR Moisture Content; and
- Data Sheet SMP-I07: Representative Dry Density.

As discussed at the pre-installation meeting, the agency provided a PVC piezometer to install through the hollow-stem auger. The PVC piezometer was 4.766-m long and 52-mm diameter. A 0.6-m long access tube was set in concrete just below the shoulder material to protect the top of the PVC piezometer and provide easy access for measurements. Additional piezometer installation notes are included in Appendix C-1.

The center of the instrumentation hole was marked on the pavement surface at Station 0-22 using the longitudinal joint between the driving lane and shoulder as a transverse reference. FWD testing was done on the five panels for SMP monitoring from Station 0-31 to Station 0+50 including a test over the instrumentation hole.

The contractor hired by the agency to core the pavement cut a 400-mm diameter core through the concrete pavement after FWD testing over the instrumentation hole was done. This was the smallest core barrel the contractor had available. The concrete core was lifted out using one expansion anchor tapped into the center of the core. The agency had elected to epoxy the core back into the pavement, and the core was washed off and set aside.

The drill rig was moved into position over the instrumentation hole and material was put into buckets as it was removed from the hole in 0.15-m lifts. The soil cement base was easily removed with the auger.

The contractor hired to install a horizontal conduit for instrumentation cables from the ditch to the instrumentation hole required about one hour to set a horizontal boring platform before conduit installation could start. The conduit was 100-mm diameter heavy-wall metal pipe that was installed below the soil cement base that extended about 0.6 m out from the concrete shoulder. See photographs in Appendix C-1.

While the horizontal conduit was being installed, the resistivity probe, thermistor probe, and TDR probes 10 through 7 were installed to get as much material back in the hole as possible in anticipation of the conduit causing some material to cave into the hole. When the contractor notified RCO staff

that the conduit was getting close to the hole, all the cables were pulled to the side of the hole away from the conduit.

While waiting for final installation of the conduit, a 12-mm diameter hole was drilled in the concrete for the pavement thermistor probe. The angle for the hole was marked on a piece of plywood, which was used as a guide. The hole came out the bottom of the concrete about 10 mm from the core hole as planned. A channel was made through the soil cement base for the teflon lead wire, and the pavement thermistor probe was inserted into the hole. Plumber's putty was used to temporarily hold the probe in place.

When the metal conduit reached the instrumentation hole 0.3 m below the soil cement base, about a 0.4-m radius of granular soil from around the conduit fell into the instrumentation hole. RCO staff removed as much of the soil as possible, but TDR probe 6 still had to be placed shallower than planned. Depths for TDR probes 5 and 4 were adjusted to compensate for the shallow depth of TDR probe 6.

After TDR probe 2 was installed, the flexible metal conduit containing all the sensor cables was pulled through the rigid metal conduit installed by the contractor. Then TDR probe 1, which was above the conduit, was placed about 150 mm below the soil cement base as advised by the Technical Assistance Contractor for LTPP. See August 2, 1995 fax in Appendix B-1. No instrumentation was placed in the soil cement base.

A wire brush was used to clean the core hole and core, and the pavement thermistor probe height was adjusted to get the tip of the probe about 20 mm below the pavement surface. Then the soil cement base was replaced with a very stiff mix of half sand and half high-early-strength cement that was compacted to a height about 5.0 mm higher than the original soil cement base. The concrete core was placed in the hole and vibrated with a tamping rod until it was the same height as the adjacent pavement.

Duct tape was placed on the pavement adjacent to the cut from the core barrel and hole drilled for the pavement thermistor probe, and W.R. Meadows "REZI-WELD 1000" multi-purpose construction epoxy was poured into the cut and hole until the epoxy was flush with the pavement surface to bond the concrete core and pavement thermistor probe in place. This medium-viscosity epoxy had a 45-minute pot life at room temperature, and it had been stored in a cooler to provide sufficient time to continue adding material as it settled in the cut and hole. After the duct tape was removed from the pavement surface, the epoxy was allowed to set up while other installation activities were completed. As of January 22, 1996, only a short hairline crack in epoxy around the core has been observed in reference to problems with the pavement repair. See photograph in Appendix D-2.

For installation reports from the LTPP North Central RCO, "Data Sheet SMP-I05(A): Lab Gravimetric Moisture Contents," is used to report agency laboratory moisture results. Also, "Data Sheet SMP-I05(B): Gravimetric Moisture Comparison" was created to summarize moisture data obtained from field moisture tests, laboratory moisture tests, and interpretation of TDR probe data. These forms, along with a plot of the moisture results, are included in Appendix C-1, and the following assumptions and conclusions were made regarding the moisture data:

- LTPP Directive Number: SM-13 "TDR Trace Interpretation Method for Calibration and Function Checks" dated August 17, 1995 was used to interpret the apparent

length of each TDR trace obtained during installation for estimating moisture results. This method was specified for "calibration and function checks," but no other method had been distributed by FHWA LTPP staff. The interpreted apparent lengths are reported on "Data Sheet SMP-I06: TDR Moisture Content" in Appendix C-1.

- Equations on pages II-2 and II-5 of the LTPP Seasonal Monitoring Program: Instrumentation Installation and Data Collection Guidelines, April 1994 were used to convert apparent lengths to gravimetric moisture estimates for the base and subgrade materials, and the results are included on "Data Sheet SMP-I05(B): Gravimetric Moisture Comparison," located in Appendix C-1. A plot comparing the TDR probe moisture data to the field and laboratory data is also included in Appendix C-1.

- The field moisture results, excluding sample 7, averaged only 0.3 percentage points greater than the laboratory moisture results. For sample 7, the field moisture result is suspect based on the moisture plot in Appendix C-1.

- The moisture estimate from TDR probe 1 was 3.1 percentage points lower than the average obtained between the field and laboratory data. This is inconsistent with the other nine TDR probes.

- The moisture estimates from TDR probes 2 through 10 average 2.4 percentage points higher than the average between the field and laboratory moisture results.

- Answers to the following questions could help explain the differences seen in the moisture data, but they are beyond the scope of this report:

    1. Are the same equations appropriate for all materials on this site?

    2. Do estimates of dry density for the subgrade used to convert from volumetric to gravimetric moisture seem reasonable given the consistently higher moisture values from the TDR probes compared to the field and laboratory results?

    3. How much influence does compaction have on the results?

"Data Sheet SMP-I07: Representative Dry Density" was used to record test data obtained during the installation to estimate the dry density of the subgrade, and the form is included in Appendix C-1. The dry density obtained was 1.82 g/cm^3 compared to 1.84 g/cm^3 reported on SHRP Form S04 from tests done in 1989.

Several items were changed regarding installation of the datalogger cabinet and weather pole as follows:

- RCO staff were not able to get the 9.1-m offset from the lane edge specified on page II-23 and Figure II-12 of the LTPP Seasonal Monitoring Program: Instrumentation Installation and Data Collection Guidelines, April 1994 because the TDR cables provided were too short. The cabinet at this site is offset about 7.6 m and the weather pole is offset about 8.1 m. This places the obstructions inside the normal 9.15-m safety zone for highways. However, FHWA LTPP Division staff approved

the two obstructions as break-away objects (page II-32 of manual) for placement inside the safety zone.

- The bottom of the front panel on the datalogger cabinet was notched about 0.1 m so the conduit buried about 0.3 m below the shoulder was easier to get into the cabinet, and it also slightly increased the distance the cabinet could be placed from the roadway.

- The conduit for the air temperature probe and tipping-bucket rain gauge signal wires was cut into the back of the cabinet above ground instead of running the conduit underground as shown in the guidelines. If the cables were run underground, the air temperature probe signal cable would have to be extended using special wire and resistors to compensate for increased lead resistance. Also, a union coupler was used on the weather pole about 0.3 m above ground to make pole installation easier.

III. SMP Data Collection

A. Initial SMP Data Collection

On August 11, 1995, final wiring of the datalogger in the cabinet was completed, test locations were marked on the pavement, and the first set of SMP data was collected.

Two cycles of FWD data were collected, as well as manual data including resistivity probe data, elevation data, and piezometer data. The RCO did not have access to the drill guide for installing snap rings for joint opening measurements until September 19, 1995. Also, the fault meter was being repaired, and no faulting data was collected on August 11, 1995. On September 19, 1995, snap rings were installed, and two sets of joint opening data and faulting data were collected. The September joint opening data and faulting data along with manual data collected August 11, 1995 are included in Appendix D-1 as follows:

- One set of contact resistance data;
- One set of four-point resistivity data;
- One ground water table measurement;
- Two sets of joint opening measurements;
- Two sets of joint faulting measurements; and
- One set of elevation data, which included shots on the agency benchmark.

Data from the piezometer should be acceptable to enter into the IMS database because the water table on this site with sandy/gravel soils had probably stabilized one day after piezometer installation.

Computer data files obtained from automated data collection using the dataloggers included the following:

- Two sets of TDR traces and CRREL voltages; and
- Temperature and precipitation data collected from the datalogger to verify operation overnight.

Temperature data from the thermistor probe should not be entered into the IMS database because of heat given off by epoxy used to repair the pavement and disturbance of material around the probe. In addition, temperature data up to several days after instrument installation will have to be reviewed to determine when the disturbed materials came back to thermal equilibrium. Data affected by the installation will have to be edited from the computer files.

B. Routine SMP Data Collection

Routine data collection done on the site from August 11, 1995 through January 22, 1996, is summarized on LTPP's standard data tracking log included in Appendix D-2. Data collection is expected to continue through July 1996 to complete the current monitoring loop.

Events that influenced the data collection and that will influence data interpretation for the site include the following:

- Low moisture content in the sandy-gravel subgrade produces short apparent lengths for the TDR probe data, and changes in moisture will be difficult to estimate. Also, the second inflection point on some of the TDR traces, especially for TDR probes 1, 3, and 4, cannot be extrapolated by the intersection of a zero slope line through the minimum and a line drawn tangent to the signal out the end of the probe, because the signal slope through the probe remains positive. Screen prints of the TDR data are included in Appendix D-2.

- Intermittent failure of the relay used to power the thermistor probe affected all 18 temperature readings. This data will have to be identified and edited from the datalogger files. Screen prints of temperature data in Appendix D-2 show the influence of the bad relay on the data.

Instrumentation and equipment problems at the site include the following:

- The relay used to power the thermistor probe had intermittent failures, and the relay was replaced January 22, 1996.

- Cold temperatures during data collection with the cable reader caused vertical shifts or spikes in some TDR traces. Screen prints in Appendix D-2 of data from December 13, 1995 and January 22, 1996 show spikes in TDR probes 8, 9, and 10 traces.

Other problems experienced at the site include failures with switch boxes used to collect manual resistance/resistivity data and failures of the CRREL multiplexer for automated resistance data collection. Print screens showing the failure modes for the CRREL multiplexer are included in Appendix D-2.

IV. Summary, Conclusions, and Recommendations

A. Instrumentation Installation Highlights

The following items are identified by the authors as unique or particular items of interest regarding this section in the SMP.

- This was the eleventh SMP installation in the LTPP North Central Region, and GPS section 313018 was one of the two Nebraska sites installed in 1995. This GPS section also has the highest traffic volume of all the SMP installations by the RCO.

- This was the first installation by the RCO where the pavement was cored and a conduit was bored under the road from the shoulder. These two activities produced minimal disturbance to the pavement structure, which in turn required only minimal pavement repair.

B. Recommendations for Improving Installations

In addition to previous modifications from other installations, the following procedure and equipment changes from protocol were used during this installation or are recommended for future installations:

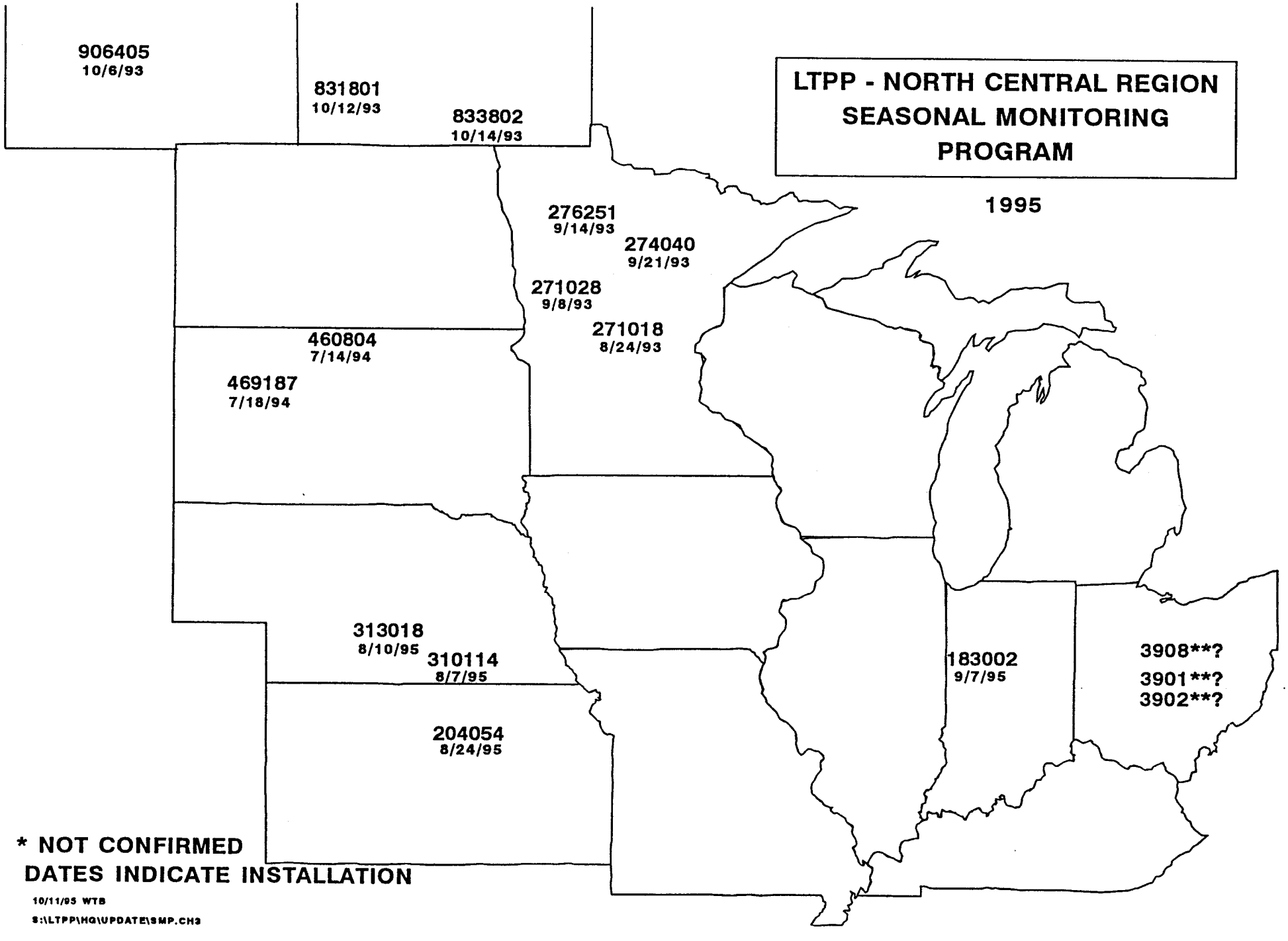
- For this installation, a 100-mm diameter conduit was horizontally bored from the ditch to the instrumentation hole to eliminate the trench usually cut across the shoulder to get the sensor cables to the datalogger cabinet. This procedure should be considered for any SMP site where the agency is not willing to cut the pavement surface from the outside wheel path to the edge of the shoulder.

- For this installation, no saw cut was available for the pavement thermistor probe, and a 12-mm diameter hole was drilled through the concrete surface at the appropriate angle for placing the pavement thermistor probe. This installation procedure minimizes any changes in the thermal characteristics of the pavement around the probe, especially compared to placing the probe in a saw cut that is usually repaired with epoxy or crack sealant.

Appendix A-1: Test Section Background Information

Appendix A-1 contains the following test section background information:

- SMP location map;
- Detailed section location map;
- SHRP Inventory Data Sheet - traffic, design factors, and layer information;
- SHRP Section Field Verification Form;
- IMS L05A and L05B tables - layer thickness and material type; and
- LTPP Form S04 - base and subgrade moisture data.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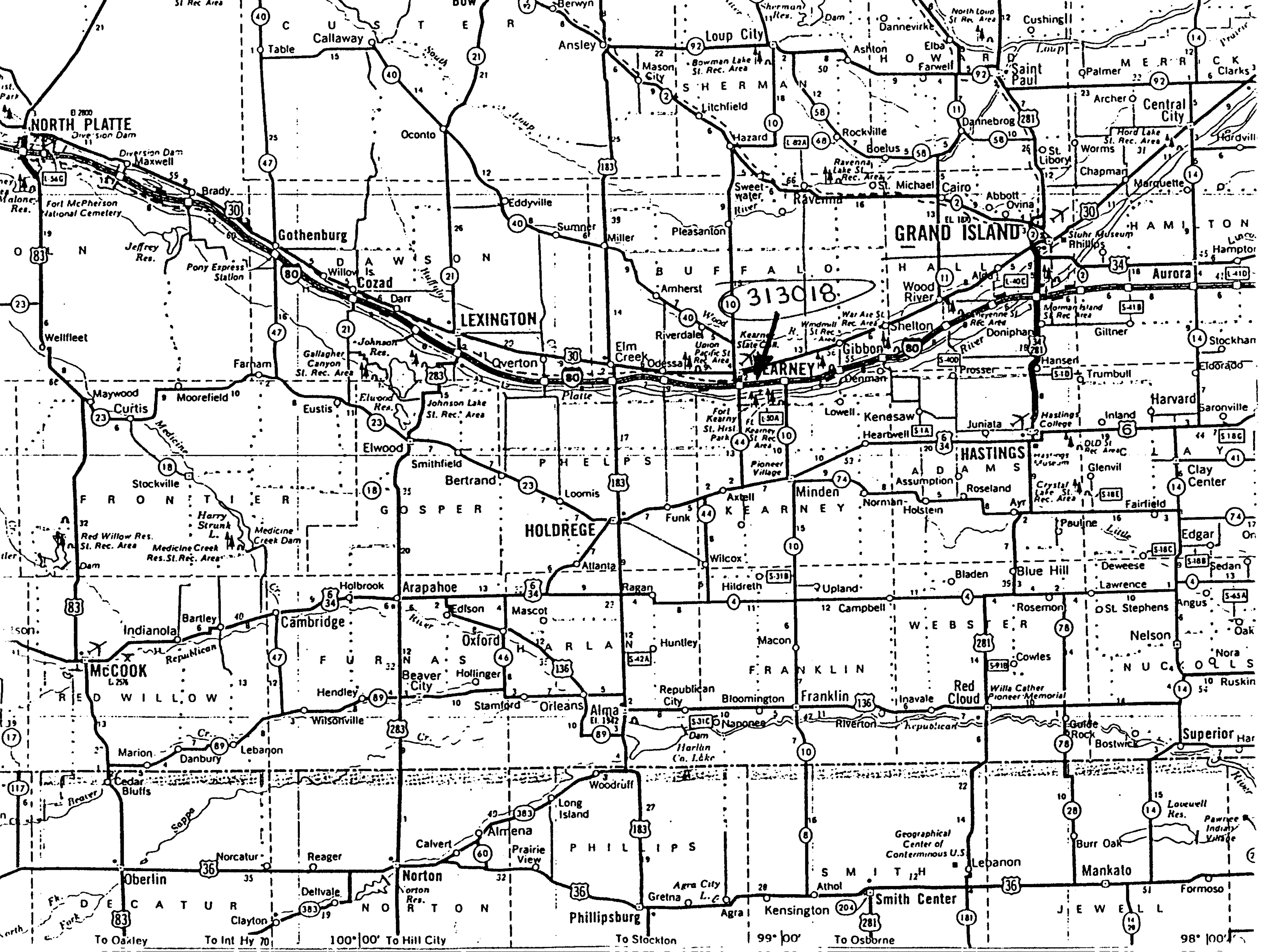

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Pioneer Village
Willa Cather Pioneer Memorial
Stuhr Museum
Hastings Museum
Red Willow Res. St. Rec. Area
Medicine Creek Res. St. Rec. Area
Harry Strunk L.
Fort McPherson National Cemetery
Pony Express Station
313018
To Oakley
To Int Hy 70
100°00' To Hill City
To Stockton
99° 00'
To Osborne
98° 00'

STRATEGIC HIGHWAY RESEARCH PROGRAM
GENERAL PAVEMENT STUDIES
Long-Term Pavement Performance Monitoring
Project Information Sheet

REGION: North Central PAVEMENT TYPE: Jointed Plain Concrete
STATE: Nebraska

SHRP Assigned ID:	313018	District:	4	Year Open:	1985
State Assigned ID:	3015	Highway:	I.H.- 80	Year Traffic:	1985
Design Cell ID:	3- 95	Length:	7.2 miles	AADT:	9890
		Lanes:	2	Trucks:	34.0 %
		Shoulder Surface Type:	Unspecified		
		Project Status:	Approved		

DESIGN FACTORS -			
Moisture:	Dry		
Temperature:	Freeze		
Subgrade:	58 - Poorly Graded Sand	Coarse	
Traffic:	600 KESAL/Yr	High	(200)
Base Type:	Cement		
PCC Thickness:	12.0 in.	High	(9.5)
Dowels:	No		

LAYER CONFIGURATION

LAYER NO.	LAYER DESCRIPTION	LAYER THICKNESS	LAYER MATERIAL TYPE
3	3 - Orig Surface	12.0	4 - Portland Cement Concrete (JPCP)
2	5 - Base Layer	5.0	27 - Soil Cement
1	7 - Subgrade		58 - Poorly Graded Sand

PAVEMENT LAYER INFORMATION

	PORTLAND CEMENT CONCRETE LAYERS			
LAYER NO.	JOINT SPACING	DOWELS	REINFORCING	CRCP STEEL
3	15.5	No	No	

Revised July 6, 1988

SECTION FIELD VERIFICATION FORM

Date 7-28-88

Rater DWJ

State Project Code 3 0 1 5
State Code 3 1
SHRP Section I.D. 3 0 1 8

Project and Section Identification

State District No. 0 4
County or Parish Buffalo (019) 1

Route Signing (Numeric Code)
- Interstate 1
- Primary 2
- State 3
- Other 4

Route Number 8 0
LTPP Experiment Code JPCP (3)
Number of Through Lanes (One Direction) 2
Direction of Travel 2

- Eastbound 1
- Westbound 2
- Northbound 3
- Southbound 4

Available Project Length (Without Discontinuities) 1500'

	Start Point	End Point
Test Section Milepoints	274.57	274.48

Additional Section Location Information*: STA 668+95.5 → 663+95.5
2986' (0.57 mi) E. of MP 274, 0.9 mi E. of Bridge at MP 273.67 (2340' W. of MP 275)

* Include distances from two landmarks (refer to specific procedures outlined in the Initial State Visit Guidelines).

Location of monument: 1' N. of N. edge of PCC. shoulder (in grass)

Geometric Information

Lane Width (Feet) 12
Lane (By Number) Included in Monitoring Section 1
(Lane 1 is Outside Lane, Lane 2 is Next to Lane 1, etc.)

Shoulder Data:	Outside Shoulder	Inside Shoulder
Total Width (Feet)	10.	6.
Paved Width (Feet)	10.	3.
Surface Type		4

- Turf 1
- Granular 2
- Asphalt Concrete ... 3
- Concrete 4
- Surface Treatment 5
- Other 6

Additional Data for PCC Shoulders:

Average Joint Spacing (Feet)	15.	15.
Skewness of Joints (Feet)	1.7	0.7
Joints Match Pavement Joints? (Yes - 1; No - 2)	1	1

SECTION FIELD VERIFICATION FORM (CONTINUED)

State Code
SHRP Section I.D. 3 0 3 1 1 8

Vertical Alignment (from plans) -

Cut, Fill, or At Grade: Fill
Depth of Cut/Fill at Start of Section: 4-6'
Depth of Cut/Fill at End of Section: 4-6'

Joint Information for JCP

Average Contraction Joint Spacing (Feet) 15.5
Average Intermediate Sawed Joint Spacing (Feet) (JRCP Only)
Skewness of Joints (Feet/Lane) 2.0

CORE 1 (Beginning of Project)

Layer No.	Layer Types*	Thickness	Brief Material Description
1	Subgrade (G)		Coarse Sand
2			
3			
4			
5			
6			
7			

Notes: No core Taken, PCC w/pcc Shoulder

CORE 2 (End of Project)

Layer No.	Layer Types*	Thickness	Brief Material Description
1	Subgrade (G)		
2			
3			
4			
5			
6			
7			

Notes:

*Layer Types: A - HMAC/Surface Treatment, P - PCC Layer, B - Base/Subbase, G - Subgrade

Revised June 8, 1988

OFFICE PLAN REVIEW FORM
(Potential Monitoring Section)

State Project Code 3 0 1 5
State Code 3 1
SHRP Project ID 3 0 1 8

Potential Monitoring Section Station Boundaries: 600+00 → 645+00 ?
660 → 750 ? , 775 → 800+00 , 875 → 925

Reference Landmarks: _____

Length of Potential Section: _____

Cut, Fill, or At Grade: Fill

Depth of Cut or Fill at Start of Section: _____

Depth of Cut or Fill at End of Section: _____

Differences between previously submitted data and plans: _____

Comments: Btw Interchange 272 & 279 on I-80 WB

Field Notes*: _____

*Include distress information obtained while driving over section.

Revised June 8, 1988

OK

DISTRESS SURVEY FORM
PCC Surfaced Pavements
(GPS Experiments 3,4,5,9)

Date 7-28-88 State Code 31

Rater DWJ SHRP Section ID 3018

	Severity Level		
	Low	Medium	High
1. "D" Cracking (Linear Feet of joints, cracks, and free edges affected)*	—	—	—
2. Joint Seal Damage** (Number of joints)	5	5*	—
3. Longitudinal Cracking (Linear Feet)	—	—	—
4. Patch or Slab Replacement Deterioration (Number and Sq. Ft.)	—	—	—
5. Pumping (Check highest severity found)	—	—	—
6. Transverse Cracking (Number of Cracks)	—	—	—

7. Corner Break** (Number) 0

8. Average Faulting**
   - < 0.4" ✓
   - 0.4-0.8" _____
   - > 0.8" _____

* Measured as percent surface area for CRCP.
** Not applicable to CRCP.

Comments Sealant is slipping well down into joint, becoming unbonded x1" deep

SHRP/LTPP LAYER THICKNESS

L05A - L05B TABLES "L05_A_B"

20-MAR-95

E**L05A DATA**			Gps Sps-- STA 0 ---------|				|- WITHIN THE SECTION -| |-------- STA 5 -------|				**L05B**									
- CN	L#	TYP-------		MATL	1	2	3	THICK	MATL	1	2	3	THICK	MATL	1	2	3	CN	L#	DESC	TYPE	THICK	MATL	1	2	3	COMMENT NOTE	INV
31 1030	1	SS		141	7									141	7			1	1	7	SS		141					1
	1	AC	5.1	1	1	2	4						5.4	1	1	2	6	1	2	4	AC	5.2	1					2
	1	AC	2	1	1	2	4						2	1	1	2	6	1	3	3	AC	2	1					2
31 3018	1	SS		202	7									202	7			1	1	7	SS		202					1
	1	TB	5.8	339	1	3	4						5.5	339	1	3	6	1	2	5	TB	5.6	339					2
	1	PC	11.8	4	1	2	4						12	4	1	2	6	1	3	3	PC	11.9	4					3
31 3023	1	SS		202	7									202	7			1	1	7	SS		202					1
	1	GB	9.8	302	4								2	302	4	6		1	2	5	GB	5.9	302	E	H			2
	1	PC	11.7	4	1	2	4						12.3	4	1	2	4	1	3	3	PC	12	4					3
31 3024	1	SS		102	7									114	7			1	1	7	SS		102	E	H			1
	1	GB	3.9	307	4								0	350	4	6		1	2	5	GB	2	307	E	H			2
	1	PC	14.5	4	1	2	4						14.2	4	1	2	6	1	3	3	PC	14.3	4					3
31 3028	1	SS		103	7									102	7			1	1	7	SS		102	E	H			1
	1	TB	2.6	331	1	3	4						2.2	331	1	3	6	1	2	5	TB	2.4	331					2
	1	PC	8.2	4	1	2	4						8.4	4	1	2	6	1	3	3	PC	8.4	4					3
31 3033	1	SS		214	7									214	7			1	1	7	SS		214					1
	1	TS	5	321	4								5	321	4			1	2	6	TS	5	321				TREATED SG NOT IN INV	1
	1	TB	4.1	319	1	2	4						5.2	319	1	2	6	1	3	5	TB	4.6	319					2
	1	PC	9.2	4	1	2	4						9.4	4	1	2	6	1	4	3	PC	9.3	4					3
31 4019	1	SS		102	7									102	7			1	1	7	SS		102					1
	1	TB	3.1	331	1	3	4						3.2	331	1	4	6	1	2	5	TB	3.2	331					2
	1	PC	9.2	5	1	2	4						9	5	1	2	6	1	3	3	PC	9.1	5					3
31 5052	1	SS		102	7									102	7			1	1	7	SS		102					1
	1	TB	2.8	331	1	3	4						2.7	331	1	3	6	1	2	5	TB	2.8	331					2
	1	PC	7.7	6	1	2	4						7.6	6	1	2	6	1	3	3	PC	7.6	6					3

Table D.4. Base and subbase materials description. (Continued)

MATERIAL TYPE	DESCRIPTION	CODE
2. Detailed Description of Treated Base/Subbase Material (Continued)		
Limerock, Caliche	Soft Carbonate Rock. Caliche is a granular material consisting of at least 70 percent calcium carbonate, obtained from the processing of a soft carbonate rock (lime rock) or calcium carbonate deposits precipitated underground in arid environments. The granular material will pass a 3-inch sieve and will typically contain a relatively high percentage passing the No. 40 sieve.	337
Lime-Treated Soil	The addition of lime to soil (usually fine-grained) which results in decreased soil density, changes in the plasticity properties of the soil and increased soil strength (also called lump-modified soil).	338
Soil Cement	Soil (generally granular soil) bound by portland cement to produce a hardened soil-cement mixture with a requirement for minimum compressive strength. Soil cement generally has a higher cement content than that used in cement-treated soil.	339
Pozzolanic-Aggregate Mixture	A mixture of natural pozzolanic aggregate or soil or flyash material that produces a stiff bound material with cementatious properties.	340
Cracked and Seated PCC Layer	The original cracked PCC surface layer has been broken or cracked and seated by rolling this material. May not be salvagable from core sampling.	341

Other (Specify if possible or use the term unknown).....350

REGION NC
E NE

SHRP-LTPP
FIELD MATERIAL SAMPLING
AND FIELD TESTING

STATE CODE 3?
SHRP ASSIGNED ID 313018

EXPERIMENT GPS 3 ROUTE/HIGHWAY I-80 Lane 1 Direction W
TEST: (a) Before Section _____ (b) After Section U FIELD SET NO. 1

IN SITU DENSITY AND MOISTURE TESTS

DCG SHEET: 24

ATOR TL Dannenrich NUCLEAR DENSITY GAUGE I.D. 573 SHEET NUMBER 14 OF 22
DATE 8-10-89 LOCATION: STATION 5+57 TEST PIT NUMBER PT1
OF LAST MAJOR CALIBRATION 4-1-89 OFFSET 2 feet from °/s
Use additional sheets if necessary

H FROM SURFACE TO THE OF THE LAYER, FEET (SEE S03)					19.5" Below top of concrete
	PAVEMENT SURFACE (AC) Test Pit O.W.P.	PAVEMENT SURFACE (AC) Between Wheelpath	BASE COURSE TOP Result, pcf Wet Dry	SUBBASE TOP Result, pcf Wet Dry	SUBGRADE TOP Result, pcf Wet Dry
1					123.1 115.1
IU 2					121.7 113.4
TY 3					122.6 114.9
4					124.8 116.9
AGE					123.1 115.1
O T238-86 Method (A,B,C)					
h, inches					12"
1					7.0
IN SITU 2					7.3
MOISTURE 3					6.7
CONTENT, % 4					6.7
AGE					6.9
HTO T239-86) IAL TYPE: (Unbound-G, eated-AT, Other-T)					

AL REMARKS: _____

TIED
[signature]
hief, Contractor
on: BET

VERIFIED AND APPROVED
Gary J. Keller
SHRP Representative
Affiliation: SHRP, INC.

MONTH-DAY-YEAR
9-10-1989
Date

Appendix A-2: Pre-Installation Monitoring Data and FWDCHECK Results

Appendix A-2 contains the following pre-installation monitoring data and FWDCHECK analysis results:

- Pre-installation pavement distress data;
- Pre-installation FWD data; and
- FWDCHECK program uniformity analysis results.

Revised May 29, 1992

SHEET 4

DISTRESS SURVEY

LTPP PROGRAM

STATE ASSIGNED ID ____

STATE CODE 31

SHRP SECTION ID 3018

DISTRESS SURVEY FOR PAVEMENTS WITH JOINTED PORTLAND CEMENT CONCRETE SURFACES

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 04/19/95

SURVEYORS: RSM, ____, ____
PAVEMENT SURFACE TEMP - BEFORE __50°C; AFTER __50°C
PHOTOS, VIDEO, OR BOTH WITH SURVEY (P, V, B) B

DISTRESS TYPE	SEVERITY LEVEL LOW	MODERATE	HIGH
CRACKING			
1. CORNER BREAKS (Number)	__0	__0	__0
2. DURABILITY "D" CRACKING (Number of Affected Slabs)	__0	__0	__0
AREA AFFECTED (Square Meters)	___.0	___.0	___.0
3. LONGITUDINAL CRACKING (Meters)	___.0	___.0	___.0
Length Sealed (Meters)	___.0	___.0	___.0
4. TRANSVERSE CRACKING (Number of Cracks)	__0	__0	__0
(Meters)	___.0	___.0	___.0
Length Sealed (Meters)	___.0	___.0	___.0
JOINT DEFICIENCIES			
5a. TRANSVERSE JOINT SEAL DAMAGE Sealed? (Y, N)			Y
If "Y" Number of Joints	__6	__0	__0
5b. LONGITUDINAL JOINT SEAL DAMAGE Number of Longitudinal Joints that have been sealed (0, 1, or 2)			2
Length of Damaged Sealant (Meters)			___.0
6. SPALLING OF LONGITUDINAL JOINTS (Meters)	___.0	___.0	___.0
7. SPALLING OF TRANSVERSE JOINTS Number of Affected Joints	__0	__0	__0
Length Spalled (Meters)	___.0	___.0	___.0

Revised May 29, 1992

SHEET 5

DISTRESS SURVEY

LTPP PROGRAM

STATE ASSIGNED ID _ _ _ _

STATE CODE 3 1

SHRP SECTION ID 3 0 1 8

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 04/19/95

SURVEYORS: R S M. _ _ _

DISTRESS SURVEY FOR PAVEMENTS WITH JOINTED PORTLAND CEMENT CONCRETE SURFACES (CONTINUED)

DISTRESS TYPE	SEVERITY LEVEL LOW	MODERATE	HIGH
SURFACE DEFORMATION			
8a. MAP CRACKING (Number)			0
(Square Meters)			0.0
8b. SCALING (Number)			1
(Square Meters)			1.0
9. POLISHED AGGREGATE (Square Meters)			0.0
10. POPOUTS (Number per Square Meter)			0
MISCELLANEOUS DISTRESSES			
11. BLOWUPS (Number)			0
12. FAULTING OF TRANSVERSE JOINTS AND CRACKS - REFER TO SHEET 6			
13. LANE-TO-SHOULDER DROPOFF - REFER TO SHEET 7			
14. LANE-TO-SHOULDER SEPARATION - REFER TO SHEET 7			
15. PATCH/PATCH DETERIORATION			
Flexible (Number)	0	0	0
(Square Meters)	0.0	0.0	0.0
Rigid (Number)	0	0	0
(Square Meters)	0.0	0.0	0.0
16. WATER BLEEDING AND PUMPING (Number of Occurrences)			0
Length Affected (Meters)			0.0
17. OTHER (Describe) _____			

Revised April 23, 1993

SHEET 6

STATE ASSIGNED ID ____

DISTRESS SURVEY

STATE CODE 31

LTPP PROGRAM

SHRP SECTION ID 3018

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 04/19/95

SURVEYORS: RSM, ___

DISTRESS SURVEY FOR PAVEMENTS WITH JOINTED PORTLAND CEMENT CONCRETE SURFACES (CONTINUED)

12. FAULTING OF TRANSVERSE JOINTS AND CRACKS

Point[1] Distance (Meters)	Joint or Crack (J/C)	Crack Length (Meters)	Well Sealed (Y/N)	Length of Joint Spalling, m L	M	H	Faulting[2], mm 0.3m	0.75m
38	J		Y				04	02
94	J		Y				03	01
1	J		Y				03	03
40	J		Y				02	02

Note 1. Point Distance is from the start of the test section to the measurement location.

Note 2. If the "approach" slab is higher than the "departure" slab, faulting is recorded as positive (+ or 0); if the "approach" slab is lower, record faulting as negative (-) and the minus sign must be used.

Revised April 23, 1993

SHEET 6

DISTRESS SURVEY

LTPP PROGRAM

STATE ASSIGNED ID ____

STATE CODE 31

SHRP SECTION ID 3018

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 04/17/95

SURVEYORS: RSM ____

DISTRESS SURVEY FOR PAVEMENTS WITH JOINTED PORTLAND CEMENT CONCRETE SURFACES (CONTINUED)

12. FAULTING OF TRANSVERSE JOINTS AND CRACKS

Point[1] Distance (Meters)	Joint or Crack (J/C)	Crack Length (Meters)	Well Sealed (Y/N)	Length of Joint Spalling, m L	M	H	Faulting[2], mm 0.3m	0.75m
1.6	J		Y				05	06
5.6	J		Y				03	02
9.9	J		Y				03	02
15.4	J		Y				05	05
20.6	J		N				03	03
24.5	J		N				03	02
28.8	J		Y				02	03
34.3	J		Y				04	02
39.3	J		Y				03	04
43.4	J		Y				03	03
47.7	J		Y				02	01
53.2	J		Y				03	03
58.4	J		Y				02	03
62.1	J		Y				02	03
66.4	J		Y				02	02
71.9	J		N				03	04
77.0	J		Y				03	02
81.0	J		N				02	02
85.3	J		Y				04	03
90.8	J		Y				02	03
95.6	J		N				04	03
99.5	J		N				01	02
103.8	J		Y				03	02
109.4	J		Y				05	05
114.6	J		Y				04	04
118.6	J		Y				02	02
122.9	J		Y				03	02
128.5	J		Y				01	04

Note 1. Point Distance is from the start of the test section to the measurement location.

Note 2. If the "approach" slab is higher than the "departure" slab, faulting is recorded as positive (+ or 0); if the "approach" slab is lower, record faulting as negative (-) and the minus sign must be used.

Revised April 23, 1993

SHEET 6

DISTRESS SURVEY

LTPP PROGRAM

STATE ASSIGNED ID __ __ __ __

STATE CODE __ __

SHRP SECTION ID __ __ __ __

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) __ __/__ __/__ __

SURVEYORS: __ __ __, __ __ __

DISTRESS SURVEY FOR PAVEMENTS WITH JOINTED PORTLAND CEMENT CONCRETE SURFACES (CONTINUED)

12. FAULTING OF TRANSVERSE JOINTS AND CRACKS

Page __ of __

Point[1] Distance (Meters)	Joint or Crack (J/C)	Crack Length (Meters)	Well Sealed (Y/N)	Length of Joint Spalling, m: L	Length of Joint Spalling, m: M	Length of Joint Spalling, m: H	Faulting[2], mm: 0.3m	Faulting[2], mm: 0.75m
133.7	J		Y				04	04
137.6	J		Y				03	03
141.9	J		Y				01	01
141.4	J		Y				04	03

Note 1. Point Distance is from the start of the test section to the measurement location.

Note 2. If the "approach" slab is higher than the "departure" slab, faulting is recorded as positive (+ or 0); if the "approach" slab is lower, record faulting as negative (-) and the minus sign must be used.

Revised May 29, 1992

SHEET 7

STATE ASSIGNED ID _ _ _ _

DISTRESS SURVEY

STATE CODE 31

LTPP PROGRAM

SHRP SECTION ID 3018

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) _ _/_ _/_ _

SURVEYORS: _ _ _, _ _ _

DISTRESS SURVEY FOR PAVEMENTS WITH JOINTED PORTLAND CEMENT CONCRETE SURFACES (CONTINUED)

13. LANE-TO-SHOULDER DROPOFF

14. LANE-TO-SHOULDER SEPARATION

Point No.	Point[1] Distance (meters)	Lane-to-shoulder[2] Dropoff (mm)	Lane-to-shoulder Separation (mm)	Well Sealed (Y/N)
1.	0.	00.	8	Y
2.	15.25	02	7.	Y
3.	30.5	02.	6	Y
4.	45.75	0.	8.	Y
5.	61.	02	09.	Y
6.	76.25	0.	06.	Y
7.	91.5	01.	07.	Y
8.	106.75	01.	08.	Y
9.	122.	04.	08.	Y
10.	137.25	02.	09.	Y
11.	152.5	03.	08.	Y

Note 1. Point Distance is from the start of the test section to the measurement location. The values shown are SI equivalents of the 50 ft spacing used in previous surveys.

Note 2. If heave of the shoulder occurs (upward movement), record as a negative (-) value. Do not record (+) signs, positive values are assumed.

SECTION	313018
DATE	
RATER	
TEMP (C)	

1

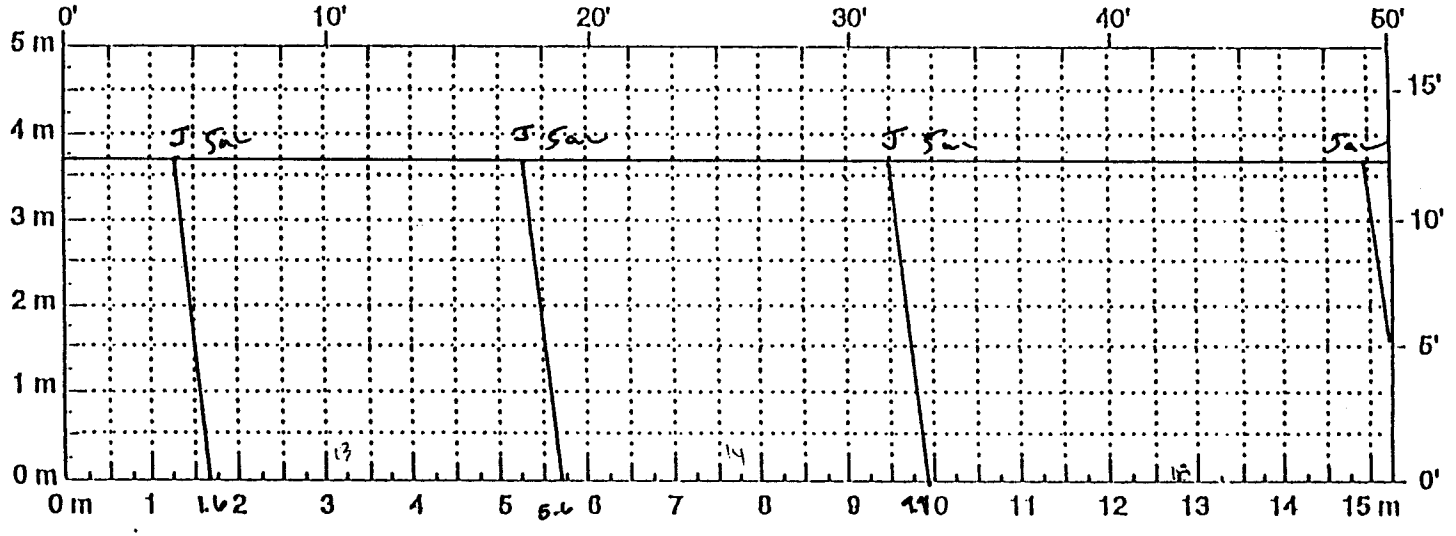
2

3

4

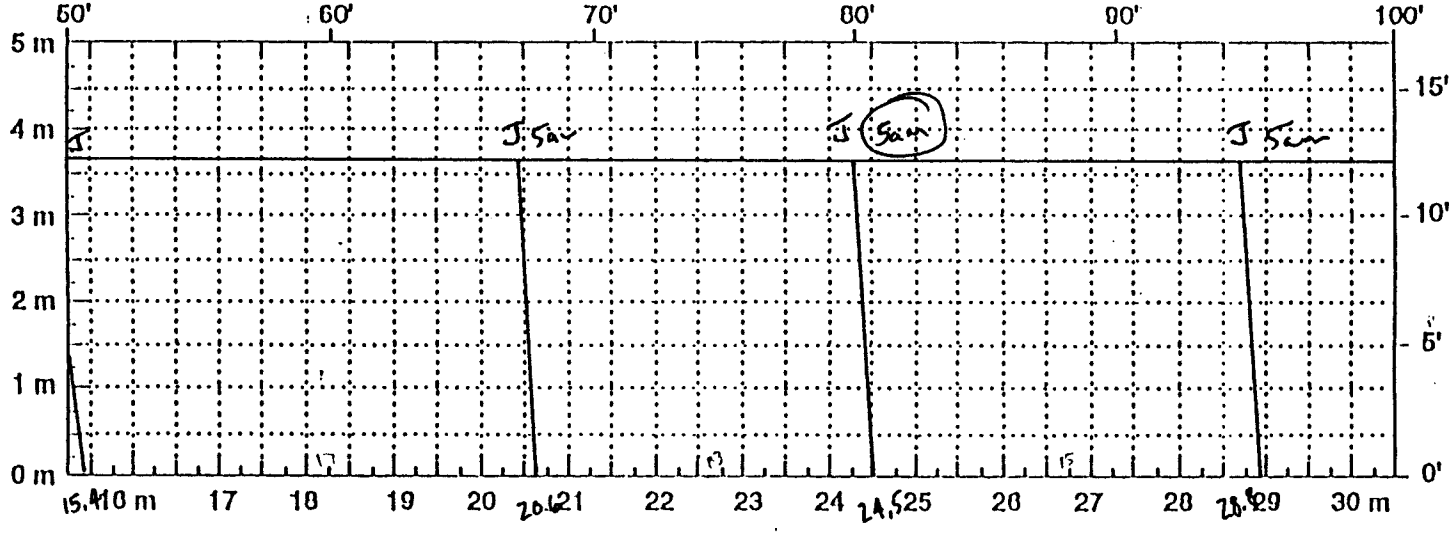
5

6



3.65' w

Comments: _____



Comments: _____

SECTION	313018
DATE	

1

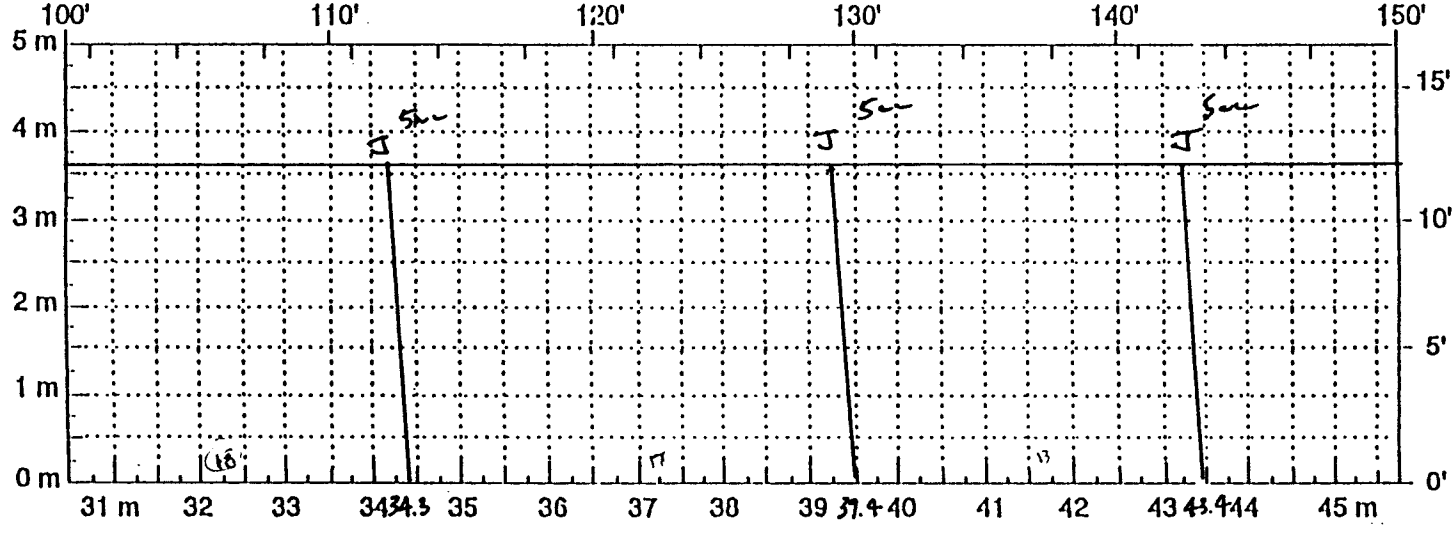
2

3

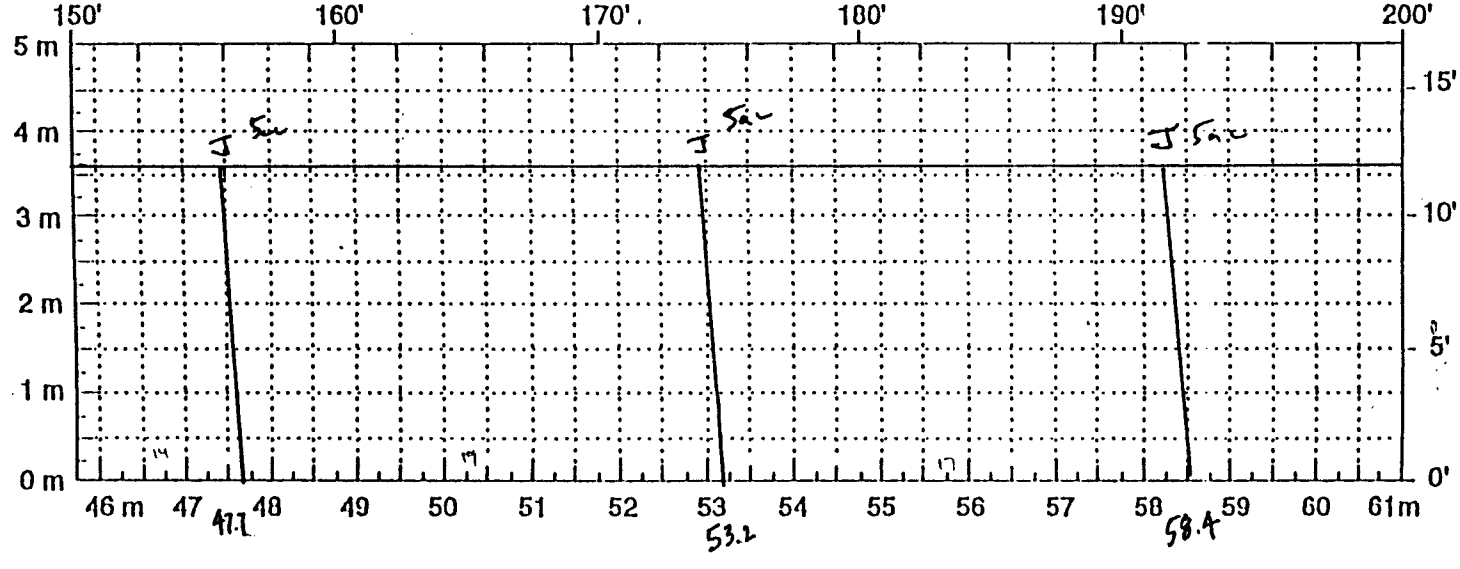
4

5

6



Comments: _____



Comments: _____ _____

SECTION	313018
DATE	

1

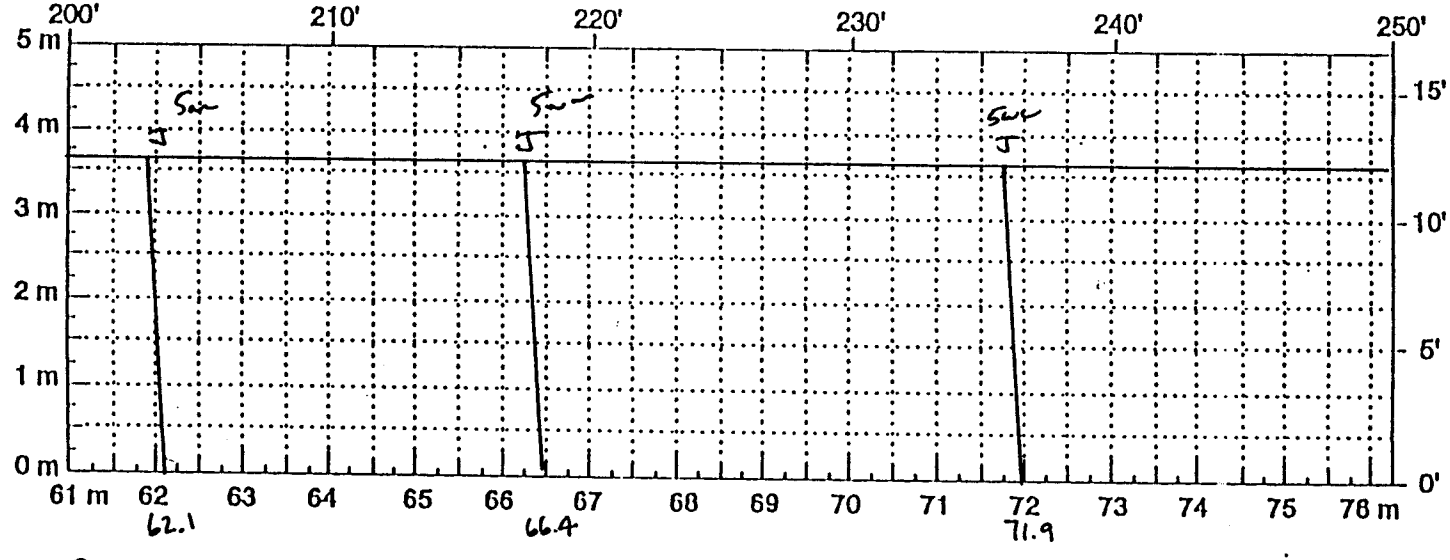
2

3

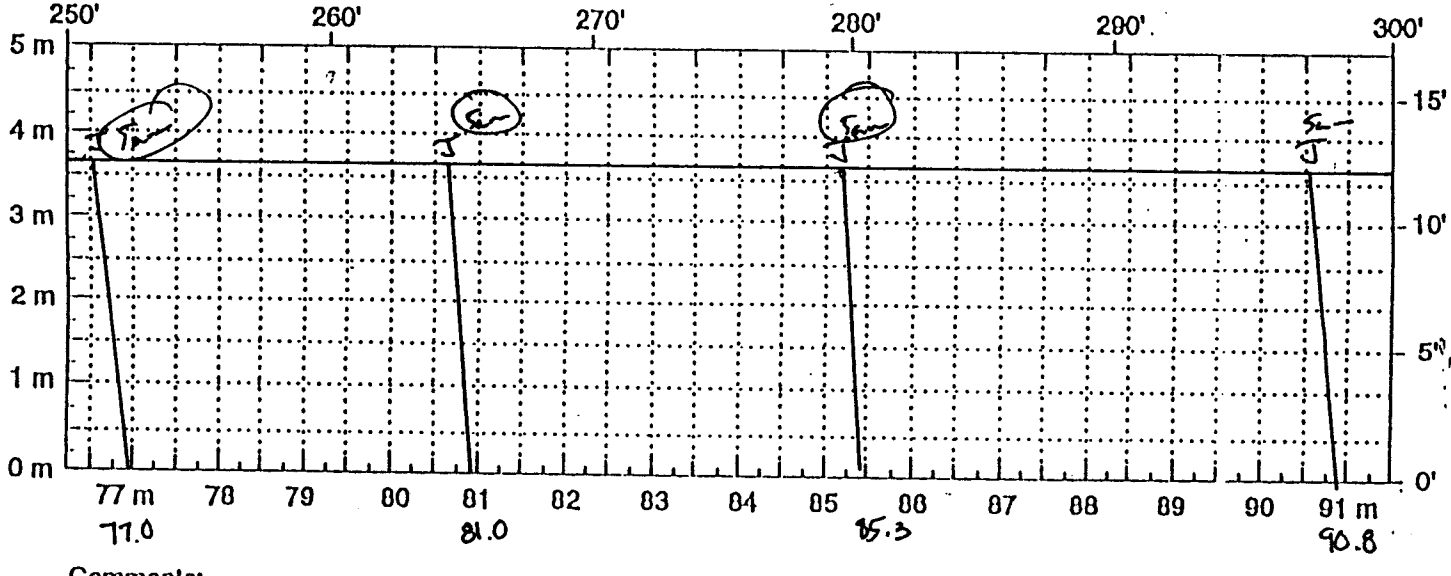
4

5

6



Comments: _____



Comments: _____

SECTION	313018
DATE	

1

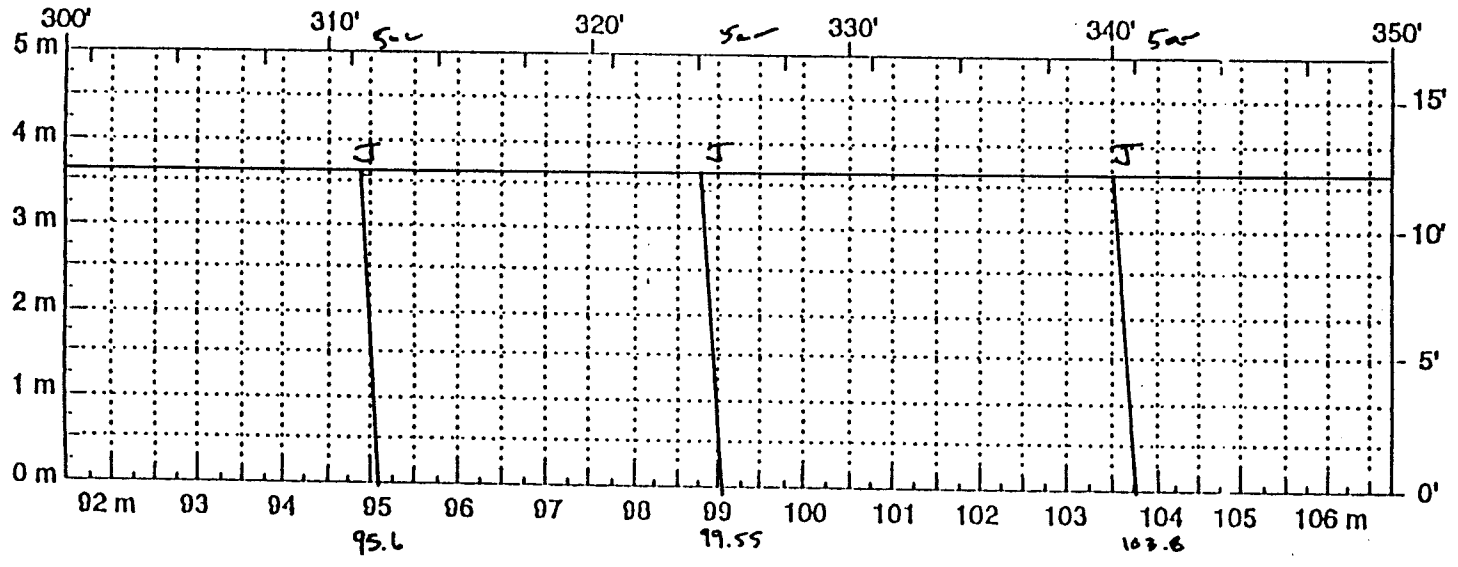
2

3

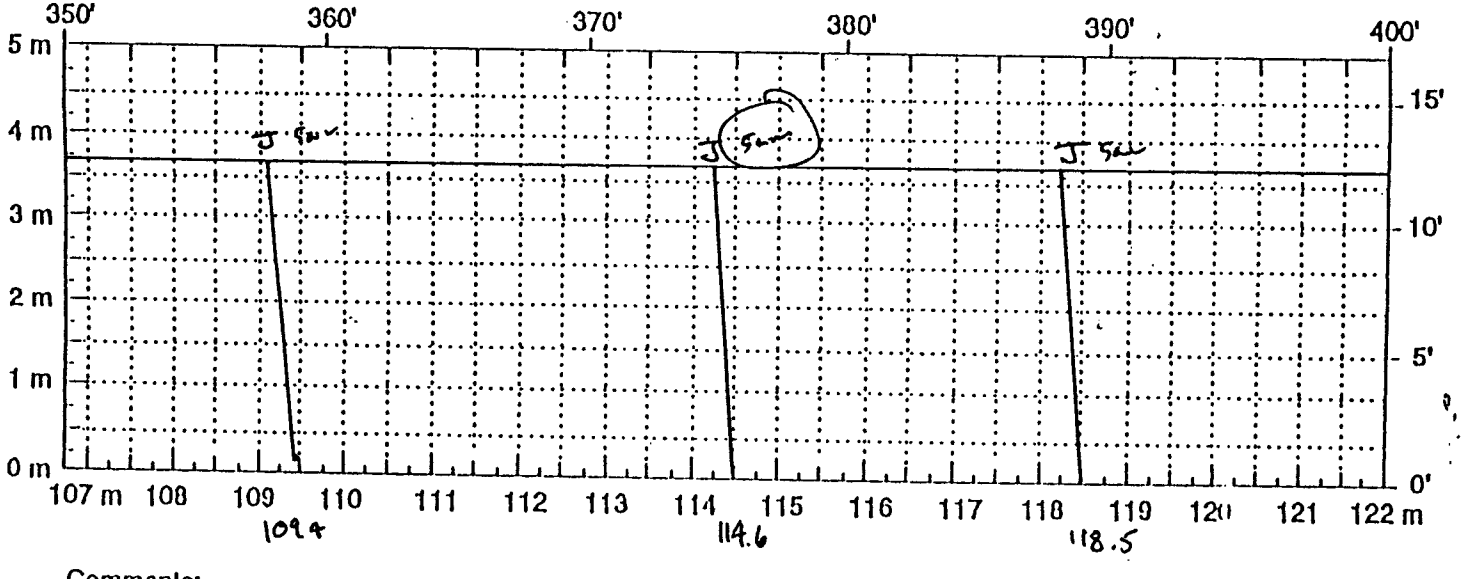
4

5

6



Comments: _____



Comments: _____

SECTION	313018
DATE	

1

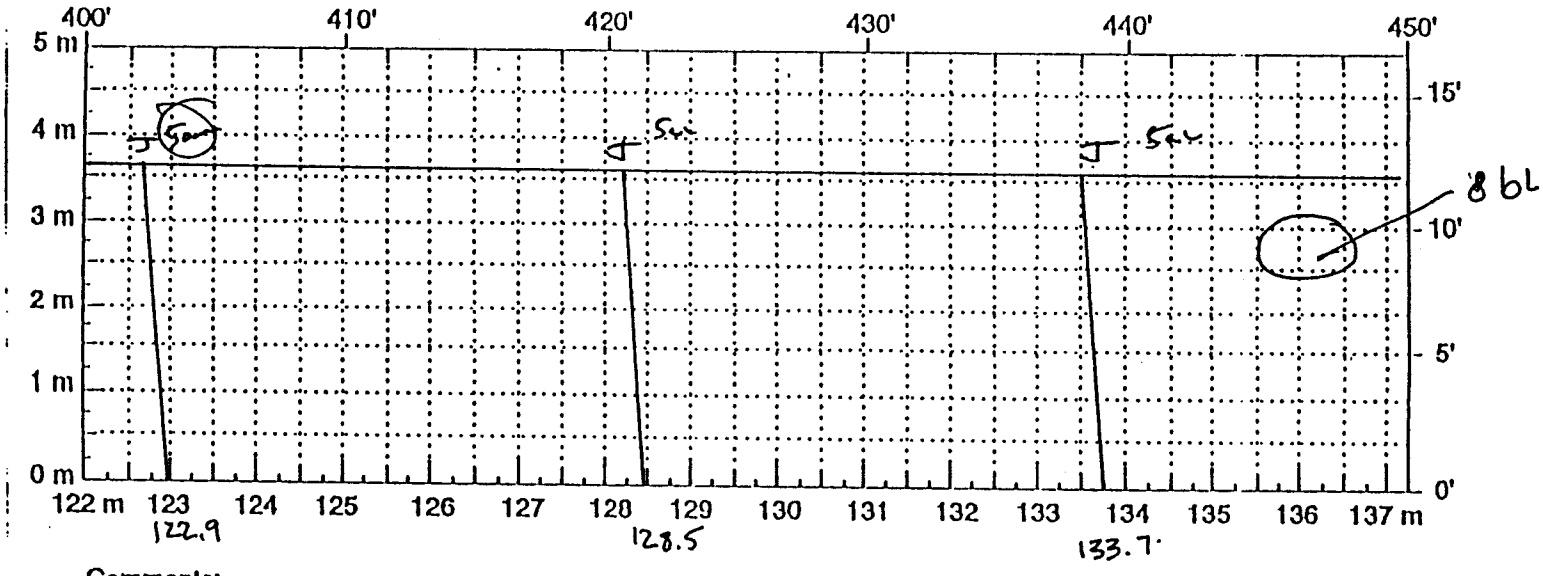
2

3

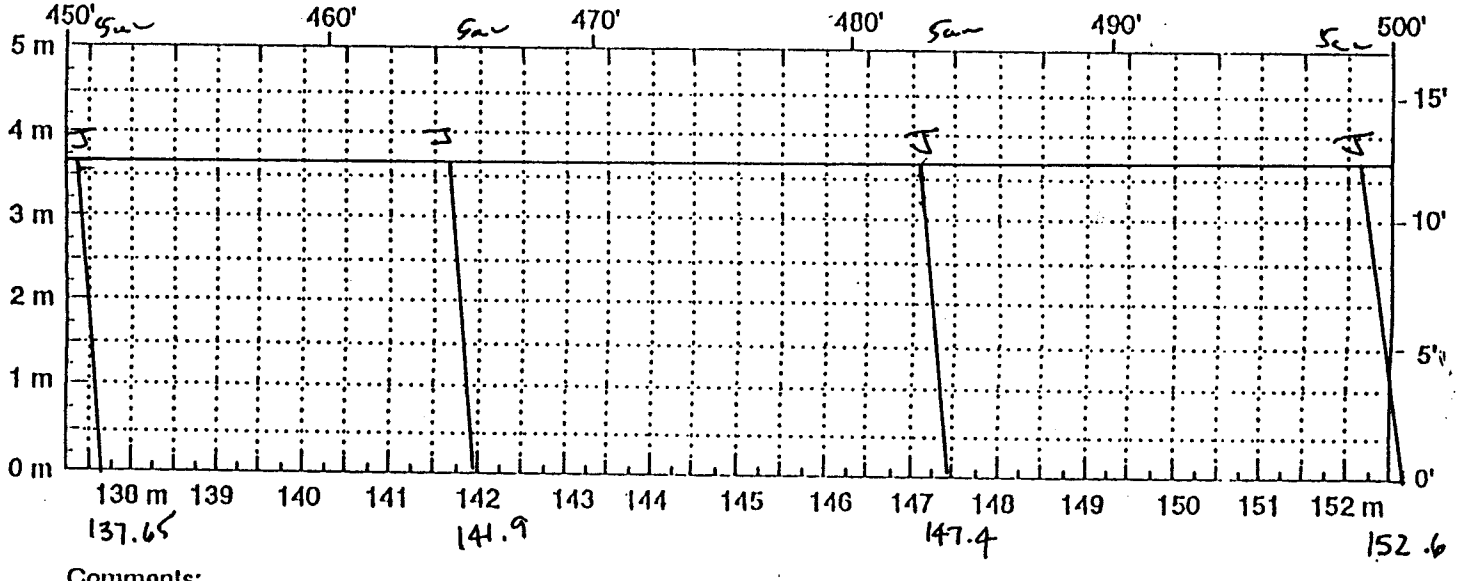
4

5

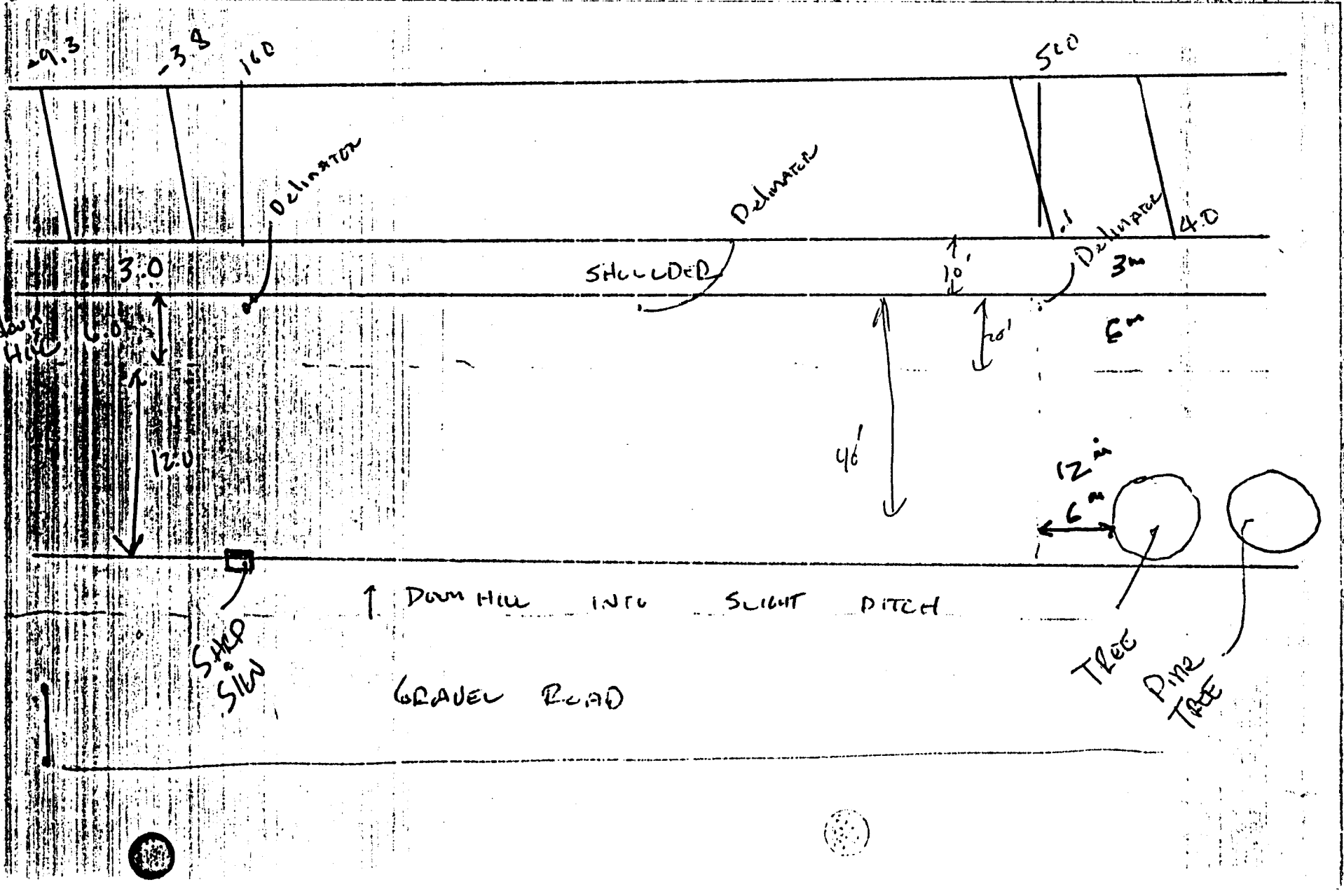
6



Comments: _____



Comments: _____


9.3
3.8
1.0
5.0
DELINATOR
DELINEATOR
SHOULDER
DELINEATOR
.1
4.0
3.0
10'
3m
6m
20'
6.0
12.0
46'
12"
6"
DOWN HILL
DOWN HILL INTO SLIGHT DITCH
SHED SIGN
GRAVEL ROAD
TREE
PINE TREE

SECTION	313018
DATE	

a.1 3.1

1

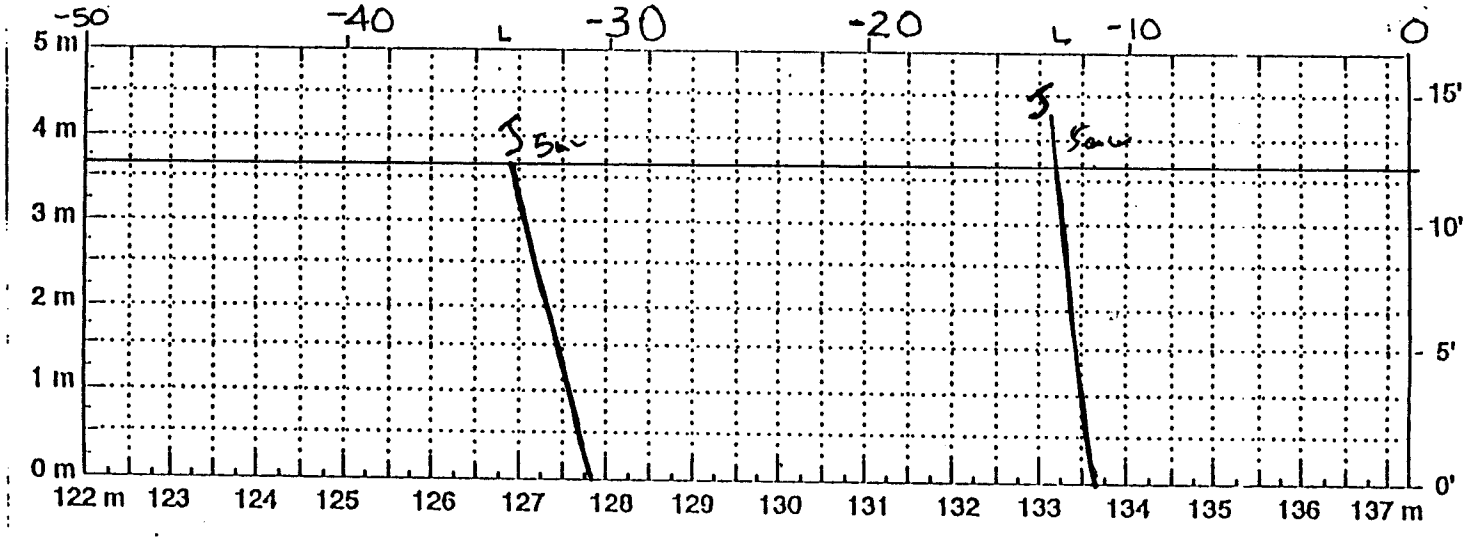
2

3

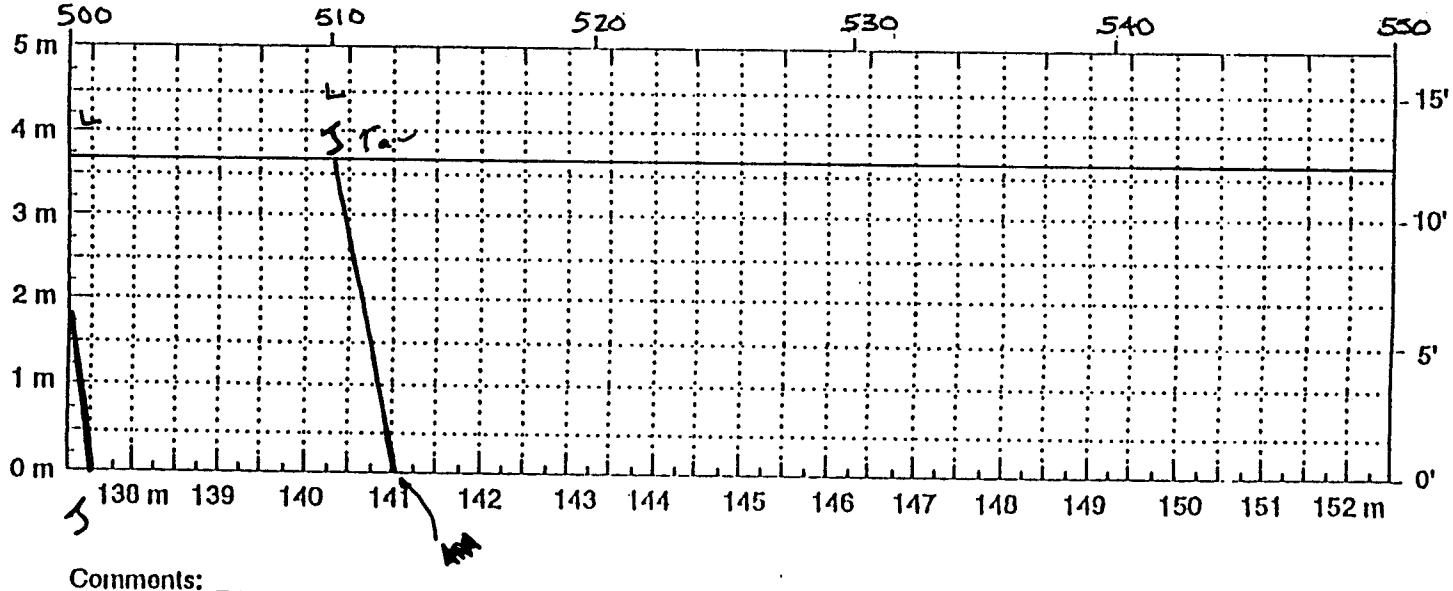
4

5

6



Comments: _____



Comments: _____

SHRP LTPP

SHRP REGION NC STATE CODE 31 SHRP ASSIGNED ID 3018

STATE NEBRASKA TESTING FWD DISTRICT

LTPP EXPERIMENT CODE ROUTE/HIGHWAY NO. I-80

TEMPERATURE MEASUREMENTS
FIELD SET NO. C

TESTING DATE 4/19/95 SHEET NUMBER OF DOG SHEET

LOCATION STATION 0-03

DEPTH MILITIME	D_1=7.1 T_1(°F)	D_2=6.0 T_2(°F)	D_3=11.0 T_3(°F)	D_4= T_4(°F)	D_5= T_5(°F)	WEATHER CONDITIONS
1030	45.0	43.9	45.5			C
1130	44.6	42.7	44.0			C
1230	55.2	44.0	44.4			PC
1330	63.7	46.3	44.8			C

LOCATION STATION 5+03

DEPTH MILITIME	D_1=1.2 T_1(°F)	D_2=6.1 T_2(°F)	D_3=11.0 T_3(°F)	D_4= T_4(°F)	D_5= T_5(°F)	WEATHER CONDITIONS
1100	44.9	43.5	44.9			C
1200	41.3	43.2	44.0			C
1300	59.1	45.7	44.9			C

NOTES: 1) D_1=DEPTH BELOW PAVEMENT SURFACE, INCHES
2) T_1=TEMPERATURE AT DEPT 1, °F
3) D_4 AND D_5 ONLY FOR GPS +7 IN ACCORDANCE WITH FIGURE 6 OF THE FWD MANUAL
4) USE ONLY THESE WEATHER TERMS: (S) SUNNY, (PC) PARTLY CLOUDY, (C) CLOUDY, (R) RAIN

TEST COMPLETED

AFFILIATION BEAN FWD OPERATOR 9 MONTH 15 DAY 95 YEAR

COMMENTS:

EXTRA TEST FOR SUMP

File: C:\FWD\DATA\313018C1.FWD
Road: I-80 WESTBOUND 1 MILE EAST OF KEARNY NEBRASKA
Subsection: 313018

FWD S/N : 8002-060
Operator ID : Mulvaney, Ronald S.

Stationing...: Feet

Diameter of Plate: 11.8
Deflector distances : 8 12 18 24 36 60

SHRP TESTING - RIGID/CRCP - BASIN AND EDGE TEST (J0/C0, J1/C1, J2/C2, J3/C3)
Sequence: CCC222233334444

Stn:	-23	Lane:J1	Temp:		J/C:		Air: 39	PvT: 40		10:29
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	115.7	12676	3.91	3.73	3.59	3.48	3.39	3.01	2.11
	C	117.4	12863	3.72	3.54	3.44	3.31	3.21	2.84	2.02
	C	118.0	12927	3.72	3.53	3.43	3.31	3.21	2.84	2.00
*	2	90.3	9892	2.72	2.59	2.51	2.44	2.37	2.10	1.46
*	2	90.1	9868	2.81	2.69	2.61	2.52	2.44	2.16	1.53
*	2	90.1	9872	2.79	2.68	2.60	2.52	2.44	2.16	1.51
*	2	89.6	9816	2.82	2.68	2.58	2.50	2.44	2.16	1.54
*	3	117.2	12839	3.85	3.66	3.54	3.44	3.33	2.95	2.13
*	3	117.3	12855	3.75	3.57	3.45	3.33	3.23	2.87	2.04
*	3	117.0	12819	3.72	3.55	3.44	3.33	3.23	2.86	2.03
*	3	116.7	12784	3.69	3.51	3.39	3.27	3.17	2.80	1.98
*	4	159.9	17523	4.96	4.73	4.57	4.41	4.27	3.78	2.65
*	4	159.5	17471	5.02	4.81	4.67	4.50	4.34	3.85	2.82V
*	4	159.1	17428	4.91	4.68	4.54	4.37	4.22	3.73	2.65
*	4	158.6	17380	4.88	4.66	4.51	4.35	4.22	3.72	2.64

Stn:	-5	Lane:J1	Temp:		J/C:		Air: 39	PvT: 40		10:32
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	114.8	12573	3.66	3.48	3.38	3.25	3.11	2.78	2.00
	C	115.2	12621	3.67	3.48	3.38	3.24	3.11	2.78	2.02
	C	115.4	12641	3.76	3.57	3.48	3.33	3.17	2.83	2.04
*	2	87.6	9602	2.72	2.61	2.56	2.50	2.41	2.12	1.53
*	2	87.7	9610	2.85	2.77	2.75	2.68V	2.57V	2.28V	1.67
*	2	87.7	9610	2.76	2.67	2.65	2.56	2.44	2.17	1.56
*	2	88.4	9685	2.79	2.70	2.67	2.56	2.41	2.14	1.52
*	3	114.4	12533	3.67	3.48	3.37	3.24	3.12	2.80	2.04
*	3	114.6	12561	3.71	3.52	3.41	3.27	3.14	2.82	2.06
*	3	114.6	12557	3.50V	3.35	3.30	3.19	3.04	2.68	1.88V
*	3	114.3	12525	3.60	3.47	3.41	3.28	3.13	2.77	1.96
*	4	157.9	17300	4.91	4.70	4.61	4.41	4.17	3.69	2.60
*	4	157.6	17269	4.89	4.67	4.56	4.39	4.19	3.73	2.70
*	4	157.8	17284	4.95	4.71	4.57	4.37	4.16	3.72	2.67
*	4	158.0	17316	4.98	4.72	4.60	4.39	4.17	3.70	2.64

Stn:	9	Lane:J1	Temp:		J/C:		Air: 39	PvT: 40		10:35
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	113.6	12450	3.96	3.70	3.63	3.44	3.24	2.87	1.95
	C	114.1	12506	4.00	3.70	3.61	3.40	3.20	2.81	1.96
	C	113.7	12454	3.97	3.69	3.62	3.42	3.22	2.83	1.96
*	2	86.4	9471	3.07	2.84	2.77	2.59	2.44	2.15	1.50
*	2	86.3	9459	3.04	2.78	2.74	2.54	2.38	2.17	1.44
*	2	86.0	9427	3.11	2.86	2.83	2.64	2.46	2.26	1.52
*	2	86.2	9447	3.14	2.85	2.79	2.59	2.44	2.23	1.55
*	3	112.9	12374	4.02	3.73	3.67	3.46	3.24	2.87	1.97
*	3	113.3	12418	4.05	3.73	3.63	3.40	3.19	2.83	1.99
*	3	113.3	12414	4.01	3.70	3.63	3.41	3.21	2.84	1.97
*	3	113.3	12418	4.06	3.78	3.71	3.49	3.26	2.92	2.04
*	4	157.0	17201	5.38	5.00	4.85	4.56	4.27	3.77	2.61
*	4	157.3	17233	5.32	4.98	4.86	4.58	4.28	3.77	2.56
*	4	156.9	17185	5.31	4.95	4.83	4.57	4.30	3.79	2.62
*	4	156.5	17149	5.38	5.00	4.85	4.57	4.30	3.78	2.63

Stn:	23	Lane:J1	Temp:		J/C:		Air: 39	PvT: 41		10:40
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	112.0	12267	3.76	3.61	3.58	3.37	3.27	2.96	2.19
	C	113.2	12402	3.85	3.83	3.57	3.33	3.26	3.00	2.23

File: C:\FWD\DATA\313018C1.FWD
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Subsection: 313018

	C	113.1	12390	3.84	3.63	3.58	3.35	3.29	3.02	2.25
*	2	86.0	9423	2.94	2.78	2.75	2.56	2.49	2.27	1.68
*	2	85.5	9367	2.80	2.68	2.68	2.52	2.49	2.26	1.65
*	2	85.3	9343	2.83	2.69	2.69	2.53	2.52	2.31	1.70
*	2	85.9	9411	2.94	2.79	2.77	2.60	2.52	2.28	1.69
*	3	113.4	12422	3.82	3.64	3.62	3.39	3.32	3.04	2.23
*	3	112.9	12374	3.81	3.61	3.55	3.35	3.28	2.98	2.23
*	3	112.5	12327	3.80	3.62	3.57	3.38	3.29	2.97	2.21
*	3	112.5	12327	3.82	3.61	3.56	3.34	3.25	2.96	2.19
*	4	156.2	17118	5.13	4.89	4.83	4.57	4.43	4.01	3.02
*	4	156.0	17090	5.14	4.89	4.82	4.55	4.43	4.02	3.02
*	4	156.2	17114	5.18	4.93	4.84	4.59	4.43	3.99	2.99
*	4	155.7	17062	5.12	4.89	4.83	4.57	4.44	4.02	3.01

Stn: 40 Lane:J1 Temp: J/C: Air: 39 PvT: 41 10:43

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	111.4	12208	3.51	3.36	3.30	3.15	3.00	2.68	1.98
	C	111.3	12196	3.48	3.32	3.26	3.11	2.97	2.66	1.93
	C	111.7	12239	3.51	3.35	3.29	3.13	2.98	2.67	1.94
*	2	84.4	9244	2.48	2.36	2.31	2.20	2.10	1.88	1.40
*	2	84.4	9244	2.60	2.48	2.43	2.33	2.22	1.97	1.44
*	2	85.2	9331	2.68	2.56	2.50	2.39	2.26	2.02	1.50
*	2	84.7	9280	2.55	2.44	2.40	2.29	2.18	1.92	1.39
*	3	111.1	12168	3.50	3.34	3.27	3.11	2.96	2.65	1.91
*	3	111.4	12204	3.50	3.34	3.29	3.15	2.99	2.69	1.94
*	3	110.8	12144	3.48	3.33	3.27	3.12	2.98	2.65	1.95
*	3	111.0	12164	3.51	3.36	3.30	3.16	3.01	2.67	1.96
*	4	154.5	16927	4.78	4.54	4.44	4.24	4.04	3.60	2.61
*	4	155.0	16987	4.78	4.55	4.46	4.27	4.07	3.65	2.65
*	4	154.9	16971	4.78	4.55	4.44	4.25	4.05	3.64	2.64
*	4	154.5	16923	4.73	4.51	4.41	4.22	4.01	3.59	2.59

Stn: 59 Lane:J1 Temp: J/C: Air: 40 PvT: 41 10:45

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	110.6	12112	3.65	3.51	3.43	3.29	3.12	2.76	2.01
	C	110.4	12092	3.62	3.46	3.38	3.24	3.12	2.79	2.00
	C	110.2	12077	3.61	3.43	3.35	3.22	3.12	2.80	2.00
*	2	83.7	9169	2.73	2.56	2.50	2.41	2.34	2.12	1.52
*	2	83.3	9129	2.70	2.56	2.52	2.42	2.33	2.08	1.48
*	2	83.6	9161	2.74	2.58	2.52	2.41	2.33	2.09	1.51
*	2	83.3	9129	2.69	2.52	2.47	2.40	2.34	2.13	1.54
*	3	110.3	12080	3.62	3.44	3.36	3.23	3.12	2.79	2.01
*	3	110.8	12144	3.64	3.45	3.37	3.25	3.13	2.78	2.00
*	3	110.3	12088	3.54	3.36	3.28	3.15	3.03	2.68	1.89
*	3	110.4	12100	3.61	3.43	3.36	3.24	3.13	2.80	2.00
*	4	153.0	16768	4.92	4.68	4.57	4.39	4.21	3.76	2.67
*	4	152.4	16701	5.01	4.77	4.66	4.47	4.29	3.81	2.74
*	4	152.8	16744	4.97	4.74	4.64	4.46	4.31	3.87	2.78
*	4	152.6	16724	4.96	4.71	4.60	4.43	4.26	3.82	2.74

Stn: 443 Lane:J1 Temp: J/C: Air: 39 PvT: 42 10:56

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	111.1	12172	4.44	4.08	3.96	3.71	3.49	3.01	2.06
	C	111.3	12192	4.39	4.02	3.93	3.69	3.47	2.98	2.02
	C	110.9	12148	4.42	4.00	3.95	3.72	3.52	3.09	2.03
*	2	84.3	9240	3.40	3.05	3.03	2.85	2.70	2.39	1.59
*	2	84.0	9200	3.37	3.02	3.00	2.82	2.67	2.38	1.56
*	2	83.8	9184	3.35	3.01	2.98	2.80	2.65	2.36	1.54
*	2	83.8	9181	3.33	3.00	2.97	2.80	2.65	2.33	1.56
*	3	110.2	12069	4.53	4.07	4.00	3.75	3.52	3.05	1.88V
*	3	111.2	12180	4.49	4.08	4.00	3.76	3.56	3.09	2.04
*	3	110.6	12120	4.43	4.01	3.96	3.73	3.54	3.11	2.09
*	3	110.3	12080	4.40	4.00	3.93	3.69	3.50	3.04	2.04
*	4	152.6	16716	5.83	5.32	5.22	4.91	4.64	4.07	2.73
*	4	152.7	16732	5.80	5.30	5.19	4.89	4.62	4.04	2.69
*	4	152.4	16697	5.81	5.31	5.20	4.89	4.61	4.02	2.70
*	4	151.9	16641	5.80	5.31	5.19	4.88	4.61	4.01	2.69

Stn: 457 Lane:J1 Temp: J/C: Air: 40 PvT: 41 10:58

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	108.7	11914	4.39	4.17	4.05	3.91	3.74	3.36	2.45

File: C:\FWD\DATA\313018C1.FWD
Road: I-80 WESTBOUND 1 MILE EAST OF KEARNY NEBRASKA
Subsection: 313018

	C	109.3	11977	4.41	4.17	4.04	3.94	3.76	3.37	2.45
	C	109.2	11969	4.41	4.16	4.03	3.93	3.75	3.35	2.44
*	2	83.0	9089	3.37	3.16	3.07	3.00	2.85	2.57	1.82
*	2	82.8	9069	3.35	3.14	3.05	2.98	2.84	2.56	1.84
*	2	82.8	9069	3.35	3.16	3.07	2.99	2.86	2.58	1.83
*	2	82.7	9061	3.36	3.16	3.06	2.99	2.85	2.56	1.85
*	3	109.2	11965	4.42	4.17	4.03	3.93	3.76	3.38	2.43
*	3	109.0	11941	4.42	4.17	4.03	3.93	3.75	3.37	2.45
*	3	109.0	11937	4.41	4.17	4.04	3.93	3.75	3.36	2.45
*	3	109.1	11949	4.41	4.17	4.03	3.93	3.75	3.35	2.44
*	4	150.7	16506	5.91	5.57	5.40	5.25	5.01	4.52	3.30
*	4	151.1	16550	5.92	5.59	5.42	5.26	5.02	4.51	3.31
*	4	151.1	16558	5.93	5.59	5.43	5.27	5.02	4.52	3.30
*	4	150.5	16490	5.91	5.59	5.41	5.26	5.02	4.51	3.31

Stn: 473 Lane:J1 Temp: J/C: Air: 39 PvT: 42 11:01

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	108.8	11926	4.29	4.06	3.96	3.84	3.69	3.31	2.39
	C	108.7	11906	4.31	4.08	3.96	3.87	3.71	3.33	2.44
	C	109.2	11965	4.30	4.06	3.95	3.83	3.66	3.25	2.35
*	2	82.3	9022	3.23	3.03	2.96	2.88	2.75	2.46	1.75
*	2	82.5	9034	3.25	3.04	2.98	2.90	2.77	2.49	1.79
*	2	82.3	9018	3.23	3.02	2.95	2.88	2.74	2.46	1.75
*	2	82.4	9030	3.25	3.04	2.98	2.90	2.78	2.48	1.78
*	3	108.8	11922	4.33	4.10	3.98	3.87	3.70	3.30	2.38
*	3	109.2	11961	4.43	4.19	4.07	3.96V	3.80	3.40	2.45
*	3	108.9	11930	4.18V	3.95V	3.85	3.76	3.60	3.23	2.37
*	3	109.2	11965	4.31	4.06	3.96	3.83	3.67	3.26	2.31
*	4	150.4	16474	5.79	5.48	5.33	5.16	4.93	4.39	3.13
*	4	150.9	16538	5.86	5.54	5.39	5.22	4.98	4.44	3.17
*	4	151.1	16550	5.86	5.54	5.39	5.21	4.98	4.41	3.19
*	4	150.8	16522	5.81	5.48	5.33	5.14	4.91	4.34	3.07

Stn: 491 Lane:J1 Temp: J/C: Air: 40 PvT: 42 11:03

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	108.8	11926	4.21	4.01	3.95	3.78	3.58	3.20	2.33
	C	108.8	11918	4.15	3.96	3.91	3.74	3.55	3.15	2.25
	C	108.8	11926	4.17	3.98	3.93	3.76	3.57	3.18	2.28
*	2	82.2	9010	3.15	2.99	2.97	2.83	2.68	2.39	1.71
*	2	82.3	9014	3.17	3.00	2.98	2.85	2.69	2.41	1.74
*	2	82.2	9010	3.16	2.99	2.98	2.85	2.69	2.41	1.73
*	2	82.2	9002	3.18	3.01	2.99	2.86	2.70	2.43	1.74
*	3	109.0	11941	4.19	4.00	3.95	3.78	3.59	3.20	2.30
*	3	109.1	11949	4.20	3.99	3.94	3.77	3.56	3.19	2.27
*	3	109.1	11953	4.21	4.00	3.93	3.73	3.53	3.10	2.22
*	3	108.8	11926	4.17	3.97	3.92	3.74	3.53	3.14	2.26
*	4	150.7	16510	5.70	5.42	5.31	5.08	4.81	4.28	3.09
*	4	150.8	16526	5.71	5.44	5.32	5.09	4.83	4.30	3.09
*	4	149.9	16426	5.61	5.34	5.26	5.04	4.78	4.28	3.10
*	4	149.7	16407	5.66	5.39	5.31	5.08	4.81	4.30	3.09

Stn: 506 Lane:J1 Temp: J/C: Air: 40 PvT: 41 11:07

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	109.2	11965	3.98	3.78	3.74	3.59	3.51	3.22	2.63
	C	108.6	11898	4.00	3.80	3.76	3.60	3.52	3.19	2.62
	C	108.6	11902	3.96	3.76	3.73	3.57	3.51	3.20	2.62
*	2	81.5	8930	2.95	2.74	2.74	2.59	2.57	2.26	1.74V
*	2	81.8	8958	2.98	2.77	2.79	2.64	2.65	2.33	1.91
*	2	81.3	8902	2.99	2.77	2.79	2.66	2.66	2.37	1.93
*	2	81.6	8938	3.01	2.81	2.84	2.70	2.72	2.41	2.02V
*	3	108.6	11898	3.99	3.75	3.75	3.57	3.56	3.26	2.67
*	3	108.3	11862	3.94	3.72	3.70	3.54	3.49	3.17	2.56
*	3	108.7	11905	3.96	3.73	3.71	3.55	3.51	3.18	2.59
*	3	108.4	11882	3.96	3.72	3.71	3.54	3.50	3.19	2.58
*	4	150.2	16458	5.35	5.05	4.99	4.79	4.68	4.26	3.53
*	4	149.2	16351	5.32	5.04	4.97	4.78	4.66	4.26	3.50
*	4	149.4	16371	5.32	5.04	4.96	4.78	4.66	4.22	3.50
*	4	149.3	16359	5.35	5.06	5.00	4.81	4.70	4.30	3.55

File: C:\FWD\DATA\313018C1.FWD
Road: I-80 WESTBOUND 1 MILE EAST OF KEARNY NEBRASKA
Subsection: 313018

Stn: 521 Lane:J1 Temp: J/C: Air: 40 PvT: 43 11:10

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	108.3	11862	3.83	3.66	3.57	3.41	3.31	2.98	2.27
	C	108.3	11870	3.75	3.58	3.50	3.34	3.24	2.93	2.21
	C	108.4	11882	3.75	3.58	3.50	3.33	3.23	2.91	2.18
*	2	81.6	8942	2.85	2.73	2.67	2.54	2.46	2.22	1.68
*	2	81.9	8970	2.87	2.74	2.69	2.55	2.48	2.22	1.67
*	2	81.6	8938	2.80	2.67	2.61	2.49	2.42	2.18	1.64
*	2	82.1	8990	2.85	2.70	2.65	2.51	2.48	2.23	1.68
*	3	108.2	11858	3.80	3.60	3.52	3.35	3.25	2.93	2.21
*	3	108.4	11882	3.78	3.59	3.51	3.35	3.25	2.93	2.20
*	3	108.1	11846	3.77	3.59	3.51	3.34	3.24	2.92	2.19
*	3	108.3	11870	3.81	3.62	3.54	3.37	3.28	2.96	2.24
*	4	149.5	16379	5.14	4.89	4.77	4.56	4.40	3.97	3.02
*	4	149.5	16383	5.15	4.89	4.78	4.57	4.43	4.00	3.06
*	4	149.2	16351	5.14	4.89	4.78	4.56	4.40	3.96	3.00
*	4	149.8	16411	5.17	4.91	4.80	4.57	4.44	4.02	3.05

Mileage:-.004 -> .099

File: C:\FWD\DATA\313018C2.FWD
Road: I-80 WESTBOUND 1 MILE EAST OF KEARNY NEBRASKA
Subsection: 313018

FWD S/N : 8002-060
Operator ID : Mulvaney, Ronald S.

Stationing...: Feet

Diameter of Plate: 11.8
Deflector distances : 8 12 18 24 36 60

SHRP TESTING - RIGID/CRCP - BASIN AND EDGE TEST (J0/C0, J1/C1, J2/C2, J3/C3)
Sequence: CCC222233334444

Stn: -30 Lane:J2 Temp: J/C: Air: 41 PvT: 43 11:16

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	107.0	11723	13.07	11.36	10.58	9.34	8.22	6.31	3.70
	C	107.1	11731	12.89	11.20	10.43	9.18	8.07	6.17	3.58
	C	107.0	11723	12.99	11.27	10.50	9.25	8.12	6.21	3.60
*	2	81.0	8871	10.75	9.32	8.69	7.63	6.70	5.10	2.91
*	2	81.0	8879	10.86	9.39	8.76	7.71	6.76	5.16	2.98
*	2	81.5	8925	10.76	9.30	8.67	7.60	6.67	5.06	2.85
*	2	81.3	8906	10.81	9.35	8.73	7.67	6.74	5.13	2.94
*	3	107.0	11723	13.04	11.31	10.54	9.28	8.17	6.23	3.60
*	3	106.7	11695	13.09	11.35	10.59	9.32	8.20	6.28	3.63
*	3	107.2	11743	13.14	11.39	10.62	9.34	8.21	6.29	3.64
*	3	106.9	11715	13.15	11.39	10.63	9.35	8.21	6.28	3.62
*	4	148.2	16236	16.15	13.95	12.99	11.43	10.06	7.69	4.52
*	4	147.6	16175	16.23	13.99	13.05	11.46	10.10	7.75	4.52
*	4	147.3	16136	16.24	14.00	13.06	11.46	10.09	7.77	4.52
*	4	147.5	16164	16.40	14.14	13.18	11.58	10.19	7.84	4.52

Stn: -23 Lane:J3 Temp: J/C: Air: 41 PvT: 42 11:18

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	107.8	11814	4.03	3.90	3.81	3.67	3.50	3.16	2.45
	C	108.0	11838	4.02	3.86	3.76	3.61	3.43	3.11	2.40
	C	108.1	11846	4.02	3.87	3.76	3.61	3.44	3.11	2.42
*	2	81.3	8910	3.06	2.91	2.86	2.73	2.61	2.37	1.80
*	2	81.3	8910	3.08	2.94	2.88	2.76	2.63	2.40	1.85
*	2	81.8	8966	3.06	2.94	2.88	2.76	2.63	2.38	1.84
*	2	81.8	8958	3.07	2.92	2.87	2.75	2.63	2.39	1.82
*	3	108.3	11870	4.01	3.87	3.78	3.60	3.43	3.11	2.39
*	3	108.2	11854	4.01	3.85	3.76	3.60	3.42	3.10	2.40
*	3	108.1	11846	4.05	3.90	3.79	3.63	3.45	3.13	2.42
*	3	108.4	11874	4.04	3.87	3.78	3.62	3.44	3.12	2.41
*	4	150.1	16446	5.54	5.34	5.22	5.02	4.79	4.37	3.39
*	4	149.7	16399	5.49	5.27	5.14	4.94	4.70	4.27	3.31
*	4	149.0	16327	5.39	5.19	5.06	4.87	4.64	4.20	3.27
*	4	149.5	16383	5.43	5.21	5.08	4.88	4.67	4.24	3.30

Stn: -12 Lane:J2 Temp: J/C: Air: 40 PvT: 42 11:21

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	107.5	11775	9.05	7.81	7.33	6.52	5.84	4.59	2.87
	C	107.4	11767	8.86	7.63	7.19	6.39	5.75	4.52	2.85
	C	107.4	11767	8.85	7.63	7.18	6.38	5.73	4.51	2.84
*	2	80.9	8859	6.96	5.97	5.64	5.02	4.53	3.54	2.20
*	2	80.7	8847	6.95	5.96	5.63	5.00	4.52	3.54	2.20
*	2	81.2	8895	6.95	5.98	5.63	5.01	4.51	3.52	2.18
*	2	80.6	8827	7.09	6.08	5.74	5.10	4.60	3.60	2.24
*	3	107.0	11723	8.82	7.58	7.15	6.35	5.71	4.48	2.81
*	3	107.0	11727	8.80	7.57	7.12	6.32	5.69	4.44	2.77
*	3	107.0	11723	8.83	7.59	7.13	6.33	5.70	4.46	2.80
*	3	106.9	11715	8.86	7.63	7.19	6.39	5.73	4.51	2.81
*	4	147.8	16188	11.48	9.91	9.30	8.27	7.43	5.85	3.75
*	4	147.8	16196	11.43	9.85	9.24	8.21	7.36	5.79	3.68
*	4	147.5	16164	11.61	10.02	9.43	8.38	7.52	5.93	3.80
*	4	147.7	16180	11.50	9.93	9.31	8.27	7.40	5.81	3.67

Stn: -4 Lane:J3 Temp: J/C: Air: 41 PvT: 43 11:23

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	107.8	11806	4.34	4.19	4.13	3.94	3.76	3.36	2.52
	C	108.6	11894	4.36	4.16	4.09	3.91	3.72	3.33	2.48

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	C	108.2	11850	4.35	4.14	4.08	3.89	3.70	3.31	2.50
*	2	81.1	8883	3.27	3.09	3.06	2.93	2.81	2.54	1.89
*	2	81.3	8902	3.37	3.18	3.15	2.98	2.85	2.57	1.91
*	2	81.3	8910	3.31	3.12	3.10	2.95	2.83	2.55	1.89
*	2	81.2	8898	3.31	3.14	3.12	2.97	2.83	2.55	1.87
*	3	107.8	11806	4.34	4.14	4.07	3.88	3.69	3.31	2.47
*	3	107.6	11794	4.25	4.09	4.03	3.85	3.67	3.26	2.44
*	3	107.6	11794	4.36	4.17	4.09	3.91	3.73	3.34	2.52
*	3	107.7	11802	4.34	4.15	4.07	3.90	3.71	3.31	2.49
*	4	148.0	16220	5.74	5.52	5.41	5.17	4.92	4.40	3.30
*	4	148.2	16236	5.73	5.50	5.40	5.18	4.95	4.43	3.35
*	4	148.6	16279	5.75	5.52	5.43	5.19	4.94	4.42	3.28
*	4	148.1	16224	5.81	5.56	5.44	5.19	4.96	4.45	3.36

Stn: 5 Lane:J2 Temp: J/C: Air: 42 PvT: 44 11:25

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	107.7	11802	8.37	7.27	6.80	6.07	5.44	4.43	2.93
	C	107.8	11810	8.22	7.15	6.67	5.94	5.32	4.32	2.89
	C	107.3	11751	8.19	7.13	6.64	5.92	5.30	4.28	2.86
*	2	81.0	8875	6.43	5.56	5.17	4.58	4.07	3.29	2.19
*	2	80.9	8863	6.41	5.54	5.15	4.58	4.09	3.31	2.23
*	2	80.8	8855	6.40	5.55	5.17	4.59	4.09	3.31	2.21
*	2	81.0	8871	6.39	5.53	5.15	4.59	4.09	3.30	2.20
*	3	107.0	11719	8.19	7.11	6.61	5.90	5.28	4.30	2.89
*	3	107.0	11723	8.19	7.10	6.61	5.90	5.29	4.28	2.84
*	3	107.3	11751	8.22	7.13	6.63	5.90	5.26	4.27	2.82
*	3	107.0	11727	8.23	7.14	6.65	5.92	5.30	4.27	2.82
*	4	147.4	16144	10.61	9.20	8.58	7.68	6.88	5.58	3.74
*	4	147.8	16188	10.60	9.16	8.52	7.61	6.82	5.56	3.72
*	4	147.6	16172	10.76	9.29	8.62	7.68	6.87	5.60	3.74
*	4	147.8	16188	10.86	9.41	8.76	7.81	6.98	5.66	3.76

Stn: 10 Lane:J3 Temp: J/C: Air: 42 PvT: 43 11:28

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	107.2	11743	4.36	4.30	4.24	4.12	3.94	3.55	2.65
	C	107.6	11787	4.36	4.29	4.23	4.09	3.91	3.48	2.58
	C	107.1	11735	4.37	4.30	4.24	4.09	3.89	3.48	2.56
*	2	80.9	8867	3.30V	3.27V	3.24	3.13	2.97V	2.65V	1.94V
*	2	81.4	8914	3.37V	3.32	3.27	3.16	3.01	2.67	1.94V
*	2	81.2	8895	3.67V	3.52	3.43	3.27	3.11	2.80	2.09
*	2	80.9	8859	3.63V	3.54V	3.48V	3.35V	3.21V	2.89V	2.20V
*	3	106.8	11699	4.38	4.27	4.18	4.03	3.87	3.48	2.62
*	3	107.6	11787	4.39	4.32	4.27	4.13	3.95	3.52	2.60
*	3	107.0	11723	4.37	4.25	4.17	4.02	3.86	3.47	2.58
*	3	107.2	11743	4.51	4.39	4.29	4.11	3.91	3.52	2.60
*	4	146.7	16077	5.83	5.67	5.54	5.33	5.13	4.60	3.43
*	4	147.0	16109	5.87	5.74	5.62	5.41	5.18	4.65	3.46
*	4	147.7	16184	6.02	5.81	5.63	5.37	5.17	4.70	3.57
*	4	147.1	16113	5.93	5.79	5.67	5.43	5.19	4.68	3.50

Stn: 19 Lane:J2 Temp: J/C: Air: 41 PvT: 43 11:31

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	107.5	11779	9.15	8.00	7.48	6.68	6.09	4.94	3.18
	C	107.6	11794	9.04	7.89	7.35	6.46	5.74	4.64	2.89
	C	106.8	11703	8.73	7.76	7.31	6.59	5.88	4.65	2.89
*	2	81.0	8871	6.96	6.20	5.88	5.31V	4.72	3.74	2.28
*	2	81.2	8895	7.05	6.11	5.64	5.01V	4.52V	3.64	2.38
*	2	81.2	8895	6.92	6.10	5.74	5.18	4.69	3.72	2.33
*	2	81.3	8910	6.88	6.15	5.79	5.24	4.70	3.67	2.30
*	3	106.8	11699	9.02	7.85	7.30	6.42	5.71	4.63	2.93
*	3	107.6	11794	8.97	7.82	7.28	6.48	5.87	4.78	3.08
*	3	107.6	11787	9.06	7.97	7.45	6.59	5.84	4.70	2.94
*	3	107.4	11767	8.88	7.79	7.30	6.56	5.94	4.77	3.05
*	4	146.7	16069	11.54	10.09	9.38	8.38	7.56	6.03	3.91
*	4	146.9	16093	11.50	10.15	9.55	8.54	7.65	6.08	3.80
*	4	147.2	16125	11.79	10.27	9.53	8.46	7.54	6.08	3.91
*	4	147.0	16105	11.72	10.24	9.55	8.49	7.62	6.11	3.91

Stn: 25 Lane:J3 Temp: J/C: Air: 42 PvT: 43 11:33

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7

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	C	107.3	11755	4.76	4.58	4.42	4.21	4.06	3.68	2.83
	C	108.1	11846	4.52	4.46	4.43	4.31	4.17	3.67	2.72
	C	107.2	11743	4.73	4.54	4.39	4.17	4.01	3.61	2.75
*	2	80.9	8867	3.55	3.40	3.28	3.16	3.15	2.83	2.18
*	2	80.8	8851	3.56	3.41	3.32	3.22	3.19	2.86	2.19
*	2	81.0	8871	3.54	3.49	3.44	3.30	3.15	2.81	2.04
*	2	80.9	8863	3.43	3.40	3.37	3.32	3.26	2.85	2.09
*	3	107.8	11806	4.71V	4.53	4.39	4.22	4.09	3.69	2.80
*	3	107.2	11743	4.57	4.49	4.42	4.29	4.17	3.69	2.78
*	3	107.0	11723	4.66	4.48	4.35	4.20	4.13	3.72	2.87V
*	3	107.0	11727	4.31V	4.24V	4.19V	4.10	4.00	3.51V	2.57V
*	4	146.9	16097	6.08	5.92	5.79	5.63	5.52	4.92	3.74
*	4	147.1	16113	6.16	5.93	5.78	5.58	5.47	4.93	3.81
*	4	146.9	16093	6.11	5.93	5.80	5.61	5.49	4.93	3.76
*	4	146.8	16089	6.24	6.01	5.84	5.65	5.55	4.99	3.83

Stn: 33 Lane:J2 Temp: J/C: Air: 42 PvT: 43 11:35

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	105.4	11548	11.56	10.07	9.42	8.35	7.48	5.80	3.46
	C	105.8	11592	11.35	9.86	9.20	8.09	7.21	5.55	3.24
	C	105.7	11580	11.35	9.92	9.30	8.21	7.31	5.58	3.23
*	2	79.8	8744	9.27	8.11	7.63	6.73	5.97	4.53	2.54
*	2	79.6	8720	9.26	8.08	7.57	6.68	5.95	4.52	2.59
*	2	79.7	8736	9.31	8.13	7.62	6.70	5.93	4.50	2.55
*	2	79.8	8748	9.21	7.98	7.44	6.48V	5.69V	4.30V	2.33V
*	3	105.8	11592	11.47	9.98	9.31	8.20	7.30	5.59	3.27
*	3	105.1	11520	11.44	9.93	9.26	8.18	7.33	5.62	3.29
*	3	105.5	11560	11.56	10.07	9.39	8.23	7.32	5.61	3.26
*	3	105.5	11556	11.53	10.05	9.40	8.26	7.33	5.59	3.23
*	4	145.9	15985	14.48	12.57	11.73	10.34	9.23	7.11	4.19
*	4	145.9	15989	14.55	12.62	11.78	10.36	9.22	7.10	4.18
*	4	146.0	15997	14.64	12.69	11.83	10.40	9.25	7.13	4.20
*	4	145.6	15958	14.68	12.73	11.88	10.43	9.27	7.14	4.19

Stn: 41 Lane:J3 Temp: J/C: Air: 43 PvT: 43 11:38

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	106.4	11659	4.62	4.45	4.41	4.26	4.11	3.70	2.74
	C	106.5	11667	4.50	4.24	4.17	3.98	3.87	3.50	2.61
	C	106.4	11659	4.43	4.22	4.18	4.03	3.93	3.54	2.64
*	2	80.3	8803	3.36	3.22	3.23	3.09	2.99	2.67	1.97
*	2	80.5	8823	3.35	3.17	3.14	3.04	2.99	2.67	2.02
*	2	80.7	8839	3.35	3.19	3.19	3.08	3.01	2.68	1.98
*	2	80.6	8831	3.32	3.20	3.22	3.12	3.02	2.67	1.96
*	3	107.1	11739	4.41	4.23	4.19	4.04	3.90	3.48	2.55
*	3	106.6	11683	4.42	4.23	4.21	4.06	3.96	3.54	2.63
*	3	106.6	11675	4.42	4.24	4.24	4.09	3.97	3.54	2.59
*	3	106.6	11675	4.43	4.21	4.19	4.05	3.97	3.56	2.64
*	4	145.8	15974	6.00	5.78	5.70	5.50	5.30	4.74	3.54
*	4	145.9	15985	6.03	5.80	5.71	5.50	5.29	4.76	3.55
*	4	145.6	15954	6.04	5.78	5.68	5.44	5.24	4.71	3.50
*	4	146.0	15993	6.08	5.83	5.74	5.51	5.30	4.75	3.56

'ACCEPTED TEST WITH NONDECREASING DEFLECTIONS

Stn: 51 Lane:J2 Temp: J/C: Air: 42 PvT: 43 11:40

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	105.9	11608	9.75	8.50	7.91	7.10	6.42	5.06	3.11
	C	106.3	11643	9.45	8.20	7.60	6.81	6.15	4.79	2.94
	C	106.2	11636	9.52	8.31	7.73	6.93	6.22	4.85	2.96
*	2	80.6	8827	7.52	6.57	6.10	5.46	4.91	3.81	2.29
*	2	80.9	8867	7.52	6.56	6.07	5.43	4.91	3.80	2.30
*	2	80.7	8839	7.55	6.57	6.08	5.44	4.93	3.85	2.32
*	2	80.8	8851	7.53	6.57	6.10	5.49	4.98	3.87	2.32
*	3	106.8	11699	9.52	8.28	7.69	6.90	6.25	4.88	2.95
*	3	106.5	11671	9.79	8.54	7.93	7.11	6.44	5.05	3.05
*	3	106.6	11683	9.63	8.39	7.79	6.99	6.32	4.94	2.97
*	3	106.6	11683	9.61	8.36	7.75	6.94	6.24	4.89	2.98
*	4	144.8	15862	12.32	10.72	9.93	8.90	7.99	6.30	3.92
*	4	144.8	15866	12.34	10.75	9.97	8.92	8.02	6.30	3.88
*	4	144.8	15862	12.41	10.81	10.03	8.96	8.05	6.31	3.91
*	4	144.5	15835	12.44	10.86	10.09	9.05	8.16	6.36	3.91

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Road: I-80 WESTBOUND 1 MILE EAST OF KEARNY NEBRASKA
Subsection: 313018

Stn: 59 Lane:J3 Temp: J/C: Air: 43 PvT: 43 11:45

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	105.4	11544	5.39	5.22	5.20	4.94	4.83	4.34	3.11
	C	105.8	11592	5.28	5.11	5.06	4.80	4.68	4.15	2.96
	C	105.8	11588	5.29	5.13	5.10	4.82	4.72	4.21	3.02
*	2	79.7	8728	4.12	3.96	4.00	3.73	3.70	3.31	2.28
*	2	78.8	8636	4.09	3.93	3.99	3.70	3.69	3.30	2.27
*	2	80.1	8771	4.08	3.94	3.92	3.70	3.57	3.20	2.21
*	2	80.5	8815	4.08	3.95	3.93	3.71	3.59	3.22	2.20
*	3	106.6	11683	5.41	5.24	5.20	4.91	4.77	4.26	2.99
*	3	106.5	11671	5.43	5.26	5.21	4.93	4.78	4.26	3.00
*	3	106.4	11659	5.48	5.30	5.26	4.97	4.82	4.28	3.02
*	3	106.4	11655	5.63V	5.47V	5.42V	5.13V	4.97	4.43	3.18V
*	4	146.3	16025	7.22	6.99	6.93	6.55	6.38	5.67	4.03
*	4	146.4	16041	7.25	7.01	6.96	6.57	6.41	5.70	4.01
*	4	146.2	16013	7.29	7.07	6.98	6.63	6.40	5.65	4.04
*	4	146.2	16013	7.31	7.09	7.02	6.65	6.46	5.75	4.06

'ACCEPTED TEST WITH NONDECREASING DEFLECTIONS

Stn: 440 Lane:J2 Temp: J/C: Air: 42 PvT: 46 11:49

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	106.5	11663	9.53	8.21	7.92	7.16	6.53	5.43	3.64
	C	106.0	11616	9.20	7.91	7.61	6.86	6.24	5.15	3.46
	C	106.3	11647	9.23	7.93	7.64	6.89	6.28	5.18	3.49
*	2	80.2	8783	7.22	6.17	5.97	5.37	4.89	4.04	2.66
*	2	80.1	8775	7.19	6.17	5.96	5.36	4.87	4.04	2.67
*	2	80.3	8803	7.23	6.21	5.99	5.38	4.90	4.06	2.66
*	2	80.5	8815	7.21	6.18	5.96	5.36	4.87	4.01	2.64
*	3	105.7	11584	9.22	7.95	7.62	6.86	6.23	5.13	3.44
*	3	106.8	11699	9.30	8.00	7.68	6.92	6.29	5.19	3.48
*	3	106.2	11640	9.29	7.99	7.67	6.92	6.29	5.19	3.49
*	3	106.0	11616	9.28	7.97	7.67	6.92	6.29	5.19	3.48
*	4	145.5	15946	12.00	10.33	9.92	8.96	8.17	6.78	4.59
*	4	146.2	16021	12.06	10.37	9.95	9.00	8.19	6.77	4.57
*	4	145.5	15946	12.06	10.35	9.96	9.01	8.22	6.81	4.59
*	4	145.8	15974	12.09	10.37	10.01	9.05	8.24	6.83	4.62

Stn: 444 Lane:J3 Temp: J/C: Air: 43 PvT: 45 11:52

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	106.4	11655	5.65	5.53	5.44	5.28	5.04	4.62	3.50
	C	106.3	11647	5.61	5.51	5.44	5.28	5.05	4.61	3.55
	C	106.2	11640	5.61	5.48	5.39	5.20	4.98	4.52	3.41
*	2	79.5	8716	4.27	4.17	4.12	3.98	3.80	3.46	2.58
*	2	79.7	8732	4.31	4.19	4.12	3.98	3.80	3.45	2.57
*	2	79.7	8736	4.28	4.17	4.12	3.97	3.78	3.42	2.52
*	2	79.7	8736	4.30	4.20	4.15	4.00	3.81	3.45	2.55
*	3	105.6	11572	5.58	5.44	5.35	5.17	4.94	4.48	3.36
*	3	106.3	11643	5.63	5.52	5.44	5.26	5.02	4.54	3.42
*	3	106.2	11636	5.63	5.51	5.42	5.24	5.00	4.53	3.38
*	3	106.2	11636	5.65	5.54	5.45	5.26	5.03	4.56	3.42
*	4	146.1	16005	7.51	7.34	7.22	6.97	6.67	6.05	4.58
*	4	146.4	16045	7.56	7.39	7.26	7.01	6.71	6.06	4.60
*	4	146.3	16033	7.57	7.41	7.30	7.05	6.74	6.10	4.62
*	4	146.1	16009	7.57	7.42	7.30	7.06	6.76	6.08	4.63

Stn: 452 Lane:J2 Temp: J/C: Air: 43 PvT: 45 11:54

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	105.7	11580	9.39	8.19	7.69	6.87	6.19	5.11	3.47
	C	105.5	11560	9.10	7.93	7.43	6.63	5.97	4.89	3.35
	C	105.5	11564	9.12	7.94	7.43	6.63	5.97	4.88	3.34
*	2	79.4	8696	7.15	6.20	5.81	5.18	4.65	3.87	2.62
*	2	79.9	8751	7.29	6.33	5.96	5.33	4.78	3.97	2.73
*	2	79.7	8728	7.16	6.20	5.83	5.19	4.66	3.87	2.63
*	2	79.7	8736	7.20	6.23	5.85	5.21	4.67	3.88	2.63
*	3	105.4	11548	9.11	7.93	7.43	6.62	5.95	4.90	3.34
*	3	105.4	11548	9.17	7.97	7.46	6.67	5.99	4.90	3.36
*	3	105.3	11532	9.18	8.00	7.50	6.69	6.02	4.94	3.41
*	3	105.4	11552	9.12	7.93	7.43	6.62	5.95	4.87	3.31
*	4	145.7	15962	11.84	10.31	9.97	8.63	7.80	6.43	4.46

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Subsection: 313018

*	4	145.9	15985	11.93	10.35	9.72	8.67	7.83	6.47	4.45
*	4	145.9	15989	11.89	10.34	9.70	8.67	7.83	6.47	4.46
*	4	146.0	15997	11.97	10.39	9.75	8.71	7.85	6.46	4.41

Stn: 458 Lane:J3 Temp: J/C: Air: 43 PvT: 45 11:56

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	105.2	11528	5.14	4.94	4.88	4.71	4.45	4.16	3.17
	C	105.4	11544	5.03	4.83	4.78	4.63	4.36	4.04	3.05
	C	105.4	11552	5.03	4.81	4.77	4.62	4.35	4.04	3.04
*	2	79.2	8672	3.86	3.67	3.64	3.51	3.30	3.08	2.30
*	2	79.4	8700	3.85	3.69	3.64	3.52	3.31	3.07	2.31
*	2	79.3	8688	3.85	3.68	3.64	3.51	3.31	3.05	2.30
*	2	79.4	8700	3.85	3.69	3.67	3.54	3.33	3.09	2.33
*	3	105.4	11548	5.06	4.83	4.76	4.58	4.33	4.00	3.02
*	3	105.6	11572	5.09	4.87	4.79	4.61	4.37	4.02	3.08
*	3	105.6	11568	5.07	4.87	4.81	4.63	4.39	4.04	3.09
*	3	105.6	11572	5.10	4.91	4.84	4.67	4.42	4.07	3.08
*	4	145.6	15954	6.77	6.50	6.41	6.19	5.88	5.39	4.11
*	4	146.3	16025	6.81	6.54	6.44	6.20	5.87	5.42	4.13
*	4	146.0	16001	6.77	6.50	6.41	6.18	5.85	5.37	4.09
*	4	145.4	15930	6.76	6.49	6.39	6.15	5.83	5.35	4.03

Stn: 466 Lane:J2 Temp: J/C: Air: 44 PvT: 46 11:59

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.9	11489	14.68	12.96	12.13	10.90	9.70	7.64	4.43
	C	104.9	11489	14.39	12.67	11.83	10.61	9.40	7.39	4.27
	C	104.6	11461	14.42	12.70	11.87	10.64	9.44	7.40	4.26
*	2	78.6	8616	11.98	10.56	9.87	8.87	7.87	6.19	3.54
*	2	79.2	8672	11.91	10.49	9.80	8.79	7.80	6.11	3.48
*	2	78.8	8636	11.89	10.47	9.79	8.78	7.78	6.10	3.48
*	2	78.8	8632	11.89	10.46	9.78	8.78	7.78	6.08	3.44
*	3	104.9	11497	14.53	12.78	11.95	10.72	9.51	7.47	4.34
*	3	105.0	11504	14.52	12.79	11.98	10.74	9.54	7.49	4.33
*	3	104.5	11453	14.54	12.81	11.99	10.75	9.54	7.48	4.31
*	3	104.9	11489	14.63	12.88	12.04	10.81	9.59	7.56	4.43
*	4	145.2	15910	17.99	15.81	14.76	13.24	11.74	9.25	5.46
*	4	145.5	15946	18.05	15.86	14.81	13.26	11.76	9.24	5.43
*	4	145.2	15910	18.06	15.87	14.81	13.28	11.76	9.22	5.38
*	4	145.4	15934	18.10	15.90	14.85	13.30	11.80	9.28	5.46

Stn: 474 Lane:J3 Temp: J/C: Air: 44 PvT: 46 12:02

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	105.6	11572	4.89	4.69	4.59	4.40	4.20	3.79	2.82
	C	105.6	11568	4.86	4.64	4.53	4.34	4.14	3.73	2.80
	C	105.2	11528	4.85	4.63	4.52	4.33	4.13	3.72	2.80
*	2	79.2	8680	3.69	3.53	3.44	3.29	3.11	2.79	2.09
*	2	79.5	8712	3.72	3.54	3.44	3.30	3.14	2.83	2.12
*	2	79.2	8676	3.71	3.53	3.44	3.31	3.14	2.83	2.12
*	2	79.4	8696	3.72	3.55	3.46	3.32	3.15	2.83	2.11
*	3	105.9	11600	4.83	4.64	4.54	4.35	4.13	3.70	2.77
*	3	105.8	11588	4.85	4.62	4.51	4.32	4.11	3.70	2.76
*	3	105.7	11580	4.85	4.62	4.51	4.32	4.11	3.70	2.76
*	3	105.8	11596	4.85	4.63	4.53	4.35	4.13	3.70	2.77
*	4	145.1	15898	6.55	6.26	6.11	5.87	5.62	5.05	3.80
*	4	145.4	15930	6.50	6.22	6.08	5.83	5.55	4.99	3.74
*	4	145.0	15890	6.52	6.22	6.07	5.82	5.54	4.99	3.75
*	4	144.7	15854	6.51	6.23	6.09	5.85	5.56	5.01	3.74

Stn: 484 Lane:J2 Temp: J/C: Air: 44 PvT: 47 12:04

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.9	11489	12.68	10.93	10.14	8.94	7.93	6.23	4.17
	C	104.4	11437	12.30	10.56	9.76	8.57	7.53	5.86	3.80
	C	104.3	11425	12.34	10.59	9.78	8.57	7.51	5.83	3.78
*	2	78.8	8628	10.07	8.62	7.97	6.97	6.11	4.73	3.06
*	2	78.8	8632	10.03	8.58	7.93	6.94	6.06	4.69	2.99
*	2	79.0	8652	10.05	8.60	7.96	6.97	6.10	4.76	3.03
*	2	78.8	8632	10.04	8.59	7.93	6.94	6.06	4.70	3.02
*	3	104.8	11485	12.29V	10.56V	9.74	8.58	7.54	5.88	3.83
*	3	104.1	11405	12.61	10.81	9.97	8.74	7.66	5.95	3.82
*	3	104.1	11409	12.41	10.65	9.82	8.63	7.57	5.92	3.87
*	3	104.3	11425	12.43	10.69	9.87	8.67	7.60	5.92	3.84

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*	4	143.8	15759	15.44	13.26	12.26	10.77	9.47	7.45	4.87
*	4	144.2	15799	15.58	13.35	12.35	10.83	9.52	7.48	4.88
*	4	143.8	15759	15.60	13.38	12.38	10.85	9.52	7.48	4.88
*	4	144.4	15823	15.69	13.44	12.43	10.89	9.59	7.51	4.90

Stn: 492 Lane:J3 Temp: J/C: Air: 45 PvT: 47 12:07

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	106.9	11707	5.52	5.37	5.26	5.02	4.77	4.24	3.09
	C	106.6	11683	5.39	5.23	5.11	4.87	4.61	4.07	2.91
	C	106.5	11667	5.40	5.22	5.12	4.89	4.63	4.09	2.93
*	2	80.5	8819	4.23	4.09	4.01	3.83	3.62	3.18	2.26
*	2	80.9	8863	4.23	4.09	4.03	3.83	3.62	3.19	2.26
*	2	80.5	8819	4.23	4.11	4.04	3.84	3.63	3.18	2.24
*	2	80.9	8859	4.30	4.17	4.08	3.89	3.69	3.26	2.33
*	3	106.8	11703	5.39	5.26	5.15	4.92	4.65	4.11	2.93
*	3	106.9	11707	5.47	5.31	5.19	4.94	4.69	4.15	2.99
*	3	106.2	11636	5.44	5.30	5.18	4.95	4.69	4.15	2.97
*	3	106.5	11663	5.44	5.30	5.19	4.96	4.69	4.14	2.95
*	4	146.3	16033	7.09	6.92	6.77	6.47	6.14	5.44	3.93
*	4	146.6	16065	7.13	6.93	6.79	6.50	6.15	5.46	3.94
*	4	146.3	16033	7.11	6.93	6.78	6.49	6.15	5.46	3.95
*	4	146.5	16049	7.15	6.96	6.82	6.52	6.19	5.51	3.99

Stn: 501 Lane:J2 Temp: J/C: Air: 45 PvT: 49 12:09

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.4	11433	10.29	8.88	8.29	7.33	6.49	5.11	3.28
	C	104.5	11449	10.00	8.60	8.00	7.08	6.25	4.90	3.13
	C	104.4	11441	10.02	8.62	8.01	7.07	6.22	4.87	3.15
*	2	78.8	8628	8.04	6.89	6.41	5.64	4.95	3.85	2.43
*	2	78.8	8632	8.04	6.90	6.42	5.65	4.96	3.85	2.44
*	2	79.1	8664	8.06	6.91	6.44	5.66	4.98	3.89	2.44
*	2	78.8	8628	8.09	6.93	6.43	5.65	4.95	3.85	2.44
*	3	104.5	11445	10.00	8.60	8.01	7.07	6.23	4.86	3.12
*	3	104.6	11465	10.03	8.62	8.02	7.08	6.24	4.88	3.13
*	3	104.2	11421	10.03	8.61	8.02	7.08	6.23	4.85	3.11
*	3	104.4	11433	10.06	8.65	8.06	7.11	6.26	4.88	3.13
*	4	143.4	15711	12.74	10.94	10.18	9.00	7.96	6.29	4.09
*	4	143.6	15735	12.77	10.94	10.19	8.98	7.94	6.24	4.01
*	4	143.4	15711	12.84	10.99	10.25	9.05	8.02	6.33	4.08
*	4	143.5	15727	12.83	11.00	10.24	9.04	7.99	6.30	4.06

Stn: 507 Lane:J3 Temp: J/C: Air: 45 PvT: 48 12:11

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.9	11493	5.24	5.16	5.09	4.91	4.70	4.23	3.22
	C	105.1	11512	5.06	4.97	4.89	4.70	4.48	3.98	2.94
	C	105.0	11504	5.12	5.05	4.97	4.78	4.57	4.05	3.03
*	2	79.4	8700	3.92	3.87	3.82	3.66	3.47	3.08	2.23
*	2	79.0	8660	3.98	3.90	3.83	3.70	3.53	3.19	2.30
*	2	79.0	8652	3.93	3.86	3.80	3.67	3.50	3.16	2.26
*	2	79.2	8672	3.78V	3.71V	3.65	3.52V	3.36V	3.02	2.16
*	3	104.6	11465	5.06	5.00	4.93	4.76	4.56	4.09	3.07
*	3	105.3	11540	5.18	5.10	5.01	4.81	4.57	4.05	2.96
*	3	105.1	11520	5.20	5.11	5.02	4.83	4.60	4.07	2.98
*	3	105.2	11524	5.17	5.07	4.99	4.80	4.56	4.03	2.97
*	4	145.0	15882	6.92	6.77	6.65	6.42	6.10	5.44	4.04
*	4	145.3	15918	6.91	6.74	6.63	6.38	6.08	5.39	4.00
*	4	145.1	15902	6.95	6.79	6.68	6.41	6.11	5.41	4.03
*	4	144.6	15846	6.96	6.80	6.69	6.43	6.13	5.43	4.04

Stn: 513 Lane:J2 Temp: J/C: Air: 45 PvT: 48 12:13

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.4	11437	9.79	8.59	8.07	7.26	6.53	5.25	3.32
	C	104.4	11437	9.85	8.65	8.13	7.32	6.61	5.34	3.46
	C	104.0	11393	9.67	8.48	7.94	7.13	6.41	5.13	3.24
*	2	78.8	8628	7.57	6.61	6.21	5.55	5.00	4.00	2.48
*	2	78.8	8636	7.62	6.65	6.25	5.59	5.02	4.00	2.48
*	2	78.8	8636	7.62	6.65	6.25	5.59	5.03	4.02	2.50
*	2	78.6	8612	7.60	6.64	6.24	5.60	5.03	4.04	2.53
*	3	104.9	11489	9.68	8.47	7.93	7.12	6.40	5.11	3.20
*	3	104.6	11461	9.65	8.46	7.93	7.11	6.39	5.09	3.21
*	3	104.6	11457	9.66	8.46	7.93	7.13	6.39	5.09	3.20

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*	3	104.3	11429	9.63	8.43	7.90	7.08	6.35	5.06	3.15
*	4	143.5	15727	12.39	10.85	10.16	9.12	8.19	6.55	4.15
*	4	143.9	15771	12.41	10.85	10.16	9.12	8.19	6.54	4.14
*	4	143.8	15755	12.43	10.88	10.18	9.13	8.20	6.55	4.15
*	4	143.7	15739	12.46	10.89	10.20	9.15	8.22	6.56	4.15

Stn: 521 Lane:J3 Temp: J/C: Air: 45 PvT: 48 12:16

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.4	11437	5.14	4.91	4.84	4.68	4.48	3.95	2.95
	C	104.2	11413	4.99	4.74	4.65	4.45	4.23	3.70	2.67
	C	104.1	11409	5.00	4.74	4.66	4.46	4.24	3.70	2.67
*	2	78.0	8549	3.85	3.65	3.58	3.43	3.26	2.86	2.05
*	2	78.2	8569	3.77	3.61	3.54	3.39	3.23	2.81	2.01
*	2	78.2	8573	3.80	3.63	3.57	3.42	3.25	2.83	2.03
*	2	78.2	8573	3.78	3.59	3.53	3.38	3.22	2.79	1.96
*	3	104.2	11417	4.99	4.75	4.66	4.46	4.24	3.69	2.63
*	3	104.0	11393	4.98	4.74	4.67	4.46	4.25	3.69	2.65
*	3	104.2	11413	5.01	4.77	4.68	4.48	4.28	3.72	2.67
*	3	104.3	11429	5.04	4.79	4.70	4.51	4.30	3.74	2.68
*	4	144.1	15791	6.77	6.44	6.31	6.05	5.76	5.05	3.68
*	4	143.7	15739	6.77	6.46	6.32	6.07	5.76	5.06	3.68
*	4	143.2	15692	6.73	6.43	6.29	6.02	5.72	5.01	3.63
*	4	143.9	15767	6.76	6.44	6.30	6.04	5.74	5.02	3.63

Mileage:-.006 -> .099

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Road: I-80 WESTBOUND 1 MILE EAST OF KEARNY NEBRASKA
Subsection: 313018

FWD S/N : 8002-060
Operator ID : Mulvaney, Ronald S.

Stationing...: Feet

Diameter of Plate: 11.8
Deflector distances : 12 12 18 24 36 60

SHRP TESTING - RIGID/CRCP - JOINT AND CRACK TEST (J4/C4, J5/C5)
Sequence: CCC222233334444

Stn: -31 Lane:J4 Temp: J/C: 27 Air: 45 PvT: 53 12:23

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	105.6	11675	8.39	7.03	2.76	2.62	2.49	2.35	1.67
	C	107.0	11719	7.91	6.63	2.71	2.57	2.44	2.32	1.66
	C	106.3	11647	7.89	6.63	2.77	2.62	2.48	2.32	1.67
*	2	80.1	8771	5.94	4.99	2.05	1.95	1.86	1.76	1.27
*	2	80.0	8767	5.96	4.99	2.03	1.92	1.83	1.76	1.25
*	2	80.3	8795	6.04	5.10	2.05	1.93	1.81	1.70	1.11V
*	2	80.1	8775	6.02	5.04	2.11	2.00	1.91	1.79	1.31
*	3	106.3	11647	7.81	6.54	2.64	2.51	2.39	2.28	1.64
*	3	106.1	11624	7.85	6.58	2.70	2.57	2.44	2.32	1.67
*	3	106.4	11655	7.83	6.57	2.69	2.56	2.42	2.24	1.67
*	3	106.4	11659	7.86	6.59	2.70	2.57	2.44	2.28	1.67
*	4	146.3	16033	10.49	8.75	3.59	3.44	3.24	2.98	2.21
*	4	146.4	16041	10.57	8.84	3.65	3.43	3.28	3.02	2.20
*	4	146.3	16033	10.47	8.74	3.60	3.42	3.25	3.03	2.21
*	4	146.4	16045	10.49	8.75	3.61	3.43	3.27	3.04	2.23

Stn: -30 Lane:J5 Temp: J/C: 27 Air: 46 PvT: 52 12:26

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	105.3	11532	8.47	3.11	6.82	6.06	5.42	4.27	2.63
	C	105.8	11588	8.32	3.19	6.69	5.93	5.30	4.15	2.58
	C	105.2	11524	8.33	3.20	6.69	5.93	5.31	4.17	2.59
*	2	78.9	8648	6.64	2.36	5.32	4.71	4.23	3.32	2.02
*	2	79.2	8672	6.60	2.38	5.30	4.69	4.20	3.28	2.00
*	2	79.3	8692	6.61	2.37	5.29	4.68	4.20	3.28	1.99
*	2	79.2	8676	6.58	2.36	5.27	4.67	4.16	3.25	1.97
*	3	105.4	11548	8.24	3.18	6.61	5.85	5.22	4.09	2.51
*	3	105.3	11536	8.35	3.31	6.72	5.97	5.36	4.23	2.66V
*	3	105.4	11548	8.30	3.24	6.67	5.90	5.29	4.16	2.56
*	3	105.2	11524	8.24	3.21	6.61	5.84	5.25	4.13	2.54
*	4	145.7	15966	10.61	4.40	8.48	7.51	6.78	5.34	3.33
*	4	145.5	15942	10.48	4.34	8.39	7.43	6.64	5.22	3.27
*	4	145.4	15926	10.57	4.36	8.45	7.49	6.70	5.26	3.32
*	4	145.5	15942	10.59	4.39	8.47	7.51	6.74	5.31	3.32

Stn: -14 Lane:J4 Temp: J/C: 40 Air: 46 PvT: 53 12:28

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	106.9	11707	6.55	5.41	2.87	2.69	2.53	2.21	1.63
	C	106.8	11703	6.20	5.14	2.80	2.64	2.48	2.19	1.62
	C	106.6	11683	6.18	5.12	2.80	2.64	2.48	2.19	1.63
*	2	80.1	8779	4.70	3.90	2.15	2.01	1.90	1.67	1.24
*	2	80.4	8811	4.69	3.90	2.15	2.03	1.92	1.69	1.25
*	2	80.5	8823	4.70	3.91	2.15	2.02	1.91	1.69	1.25
*	2	80.3	8803	4.69	3.91	2.16	2.03	1.91	1.67	1.26
*	3	106.8	11703	6.16	5.10	2.79	2.63	2.48	2.19	1.61
*	3	106.6	11679	6.22	5.15	2.82	2.68	2.53	2.25	1.65
*	3	106.3	11643	6.18	5.11	2.82	2.65	2.48	2.19	1.63
*	3	106.5	11663	6.20	5.14	2.84	2.67	2.51	2.22	1.65
*	4	146.0	16001	8.30	6.85	3.72	3.52	3.31	2.91	2.16
*	4	146.3	16025	8.30	6.87	3.75	3.54	3.31	2.93	2.17
*	4	145.9	15989	8.24	6.81	3.71	3.50	3.27	2.90	2.15
*	4	146.1	16009	8.24	6.80	3.71	3.47	3.28	2.91	2.15

Stn: -13 Lane:J5 Temp: J/C: 40 Air: 46 PvT: 52 12:32

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	106.3	11643	6.70	3.05	5.48	4.88	4.38	3.54	2.33

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	Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
		C	106.1	11624	6.48	3.11	5.30	4.71	4.21	3.39	2.23
		C	105.8	11592	6.48	3.12	5.30	4.72	4.22	3.41	2.25
*		2	79.5	8712	5.01	2.33	4.10	3.65	3.26	2.63	1.72
*		2	79.9	8751	5.05	2.36	4.13	3.69	3.30	2.65	1.75
*		2	79.9	8755	5.03	2.33	4.12	3.66	3.28	2.63	1.74
*		2	79.7	8736	5.04	2.34	4.13	3.68	3.30	2.66	1.76
*		3	105.8	11588	6.48	3.13	5.29	4.71	4.21	3.39	2.21
*		3	105.8	11592	6.49	3.14	5.31	4.72	4.22	3.40	2.23
*		3	105.5	11564	6.46	3.13	5.28	4.70	4.21	3.39	2.23
*		3	105.7	11584	6.53	3.17	5.34	4.76	4.27	3.46	2.27
*		4	145.4	15926	8.63	4.31	7.02	6.26	5.63	4.54	3.00
*		4	145.5	15942	8.59	4.30	6.98	6.22	5.59	4.50	2.96
*		4	145.4	15934	8.56	4.27	6.96	6.21	5.57	4.49	2.94
*		4	145.4	15926	8.61	4.33	7.00	6.25	5.63	4.53	2.96

Stn: 4 Lane:J4 Temp: J/C: 43 Air: 47 PvT: 53 12:35

	Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
		C	105.0	11509	7.11	5.83	2.73	2.51	2.44	2.28	1.67
		C	105.4	11544	6.73	5.50	2.66	2.46	2.39	2.21	1.65
		C	105.6	11568	6.71	5.49	2.65	2.45	2.37	2.20	1.65
*		2	79.0	8652	5.03	4.11	2.00	1.85	1.79	1.68	1.22
*		2	79.0	8660	5.06	4.15	2.04	1.89	1.81	1.68	1.25
*		2	79.1	8668	5.07	4.15	2.04	1.90	1.83	1.69	1.26
*		2	79.1	8668	5.09	4.18	2.04	1.89	1.82	1.69	1.26
*		3	105.2	11524	6.76	5.56	2.75	2.54	2.48	2.33	1.78
*		3	105.3	11536	6.73	5.51	2.67	2.46	2.39	2.26	1.67
*		3	105.2	11524	6.78	5.56	2.72	2.50	2.44	2.32	1.70
*		3	104.8	11481	6.85	5.63	2.85V	2.63V	2.56	2.41	1.80
*		4	144.5	15831	9.19	7.51	3.56	3.31	3.22	2.96	2.26
*		4	145.0	15882	9.10	7.44	3.38V	3.11V	3.03V	2.83	2.05V
*		4	145.0	15890	9.11	7.44	3.52	3.27	3.17	2.91	2.21
*		4	144.6	15846	9.13	7.46	3.56	3.29	3.20	3.00	2.26

Stn: 5 Lane:J5 Temp: J/C: 43 Air: 46 PvT: 53 12:37

	Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
		C	105.0	11504	6.48	2.91	5.12	4.61	4.21	3.46	2.30
		C	105.2	11524	6.52	2.93	5.15	4.63	4.22	3.46	2.31
		C	105.4	11548	6.54	2.95	5.17	4.65	4.23	3.48	2.31
*		2	78.6	8612	5.02	2.23	4.00	3.59	3.30	2.73	1.80
*		2	78.9	8648	5.02	2.22	3.99	3.59	3.28	2.70	1.76
*		2	79.3	8688	5.06	2.24	4.00	3.60	3.28	2.70	1.77
*		2	79.4	8700	5.06	2.24	4.02	3.61	3.30	2.74	1.79
*		3	105.5	11556	6.60	3.00	5.20	4.69	4.27	3.52	2.35
*		3	105.6	11572	6.56	2.96	5.19	4.66	4.21	3.47	2.32
*		3	105.3	11536	6.53	2.95	5.17	4.65	4.22	3.47	2.31
*		3	104.9	11497	6.52	2.95	5.16	4.65	4.22	3.46	2.31
*		4	144.5	15835	8.63	3.96	6.83	6.13	5.54	4.57	3.11
*		4	145.5	15942	8.72	4.08	6.90	6.21	5.65	4.63	3.13
*		4	145.1	15902	8.64	3.95	6.82	6.12	5.53	4.56	3.04
*		4	145.2	15906	8.63	3.94	6.82	6.13	5.54	4.55	3.08

Stn: 16 Lane:J4 Temp: J/C: 37 Air: 48 PvT: 54 12:40

	Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
		C	105.8	11596	6.75	5.58	3.09	2.93	2.78	2.52	1.83
		C	105.8	11596	6.32	5.23	2.91	2.77	2.66	2.42	1.76
		C	105.5	11556	6.32	5.23	2.91	2.76	2.64	2.36	1.75
*		2	79.5	8708	4.80	3.96	2.23	2.13	2.06	1.90	1.38
*		2	79.5	8712	4.67	3.84	2.12	2.02	1.94	1.77	1.29
*		2	79.2	8672	4.70	3.89	2.17	2.07	1.98	1.82	1.31
*		2	79.7	8728	4.72	3.89	2.13	2.04	1.96	1.80	1.27
*		3	105.8	11596	6.31	5.22	2.89	2.76	2.65	2.44	1.76
*		3	105.9	11608	6.35	5.26	2.94	2.80	2.68	2.44	1.79
*		3	105.6	11572	6.35	5.26	2.94	2.80	2.68	2.43	1.80
*		3	105.7	11576	6.31	5.23	2.91	2.76	2.64	2.36	1.73
*		4	144.3	15811	8.60	7.08	3.88	3.69	3.50	3.16	2.33
*		4	145.2	15914	8.61	7.10	3.90	3.69	3.52	3.20	2.39
*		4	144.7	15850	8.62	7.09	3.89	3.70	3.57	3.22	2.38
*		4	144.9	15874	8.61	7.09	3.91	3.66	3.48	3.19	2.35

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Stn:	18	Lane:J5	Temp:		J/C: 37	Air: 47	PvT: 54		12:42
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.7	11477	6.81	3.24	5.54	5.00	4.50	3.75	2.43
	C	105.0	11508	6.44	3.17	5.22	4.71	4.24	3.50	2.30
	C	104.6	11465	6.41	3.12	5.16	4.68	4.20	3.52	2.27
*	2	78.7	8624	4.94	2.40	3.99	3.63	3.26	2.74	1.77
*	2	79.2	8672	5.09	2.49	4.15	3.78	3.41V	2.88	1.93V
*	2	79.0	8660	4.93	2.37	3.98	3.62	3.24	2.73	1.75
*	2	79.0	8656	4.96	2.41	4.01	3.65	3.28	2.75	1.79
*	3	105.1	11520	6.52	3.22	5.26	4.76	4.28	3.59	2.35
*	3	105.4	11552	6.55	3.25	5.30	4.80	4.32	3.60	2.39
*	3	104.8	11485	6.48	3.21	5.24	4.76	4.27	3.59	2.35
*	3	104.9	11489	6.48	3.21	5.24	4.74	4.26	3.53	2.33
*	4	144.0	15779	8.63	4.31	6.96	6.27	5.65	4.65	3.11
*	4	144.5	15835	8.65	4.34	6.98	6.28	5.66	4.65	3.12
*	4	144.1	15791	8.43	4.09V	6.72V	6.03V	5.40V	4.42V	2.85V
*	4	144.2	15799	8.67	4.32	6.98	6.30	5.66	4.67	3.08

Stn:	33	Lane:J4	Temp:		J/C: 37	Air: 47	PvT: 54		12:44
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.9	11489	7.26	5.98	2.78	2.64	2.50	2.36	1.63
	C	104.7	11473	6.83	5.59	2.60	2.48	2.35	2.22	1.55
	C	104.8	11481	6.76	5.55	2.60	2.47	2.33	2.16	1.54
*	2	78.5	8601	5.13	4.20	1.97	1.85	1.77	1.67	1.15
*	2	78.8	8628	5.07	4.15	1.91	1.82	1.72	1.59	1.10
*	2	78.9	8640	5.11	4.19	1.98	1.88	1.77	1.64	1.15
*	2	79.0	8660	5.13	4.21	2.03	1.93	1.82	1.70	1.20
*	3	105.0	11500	6.83	5.59	2.61	2.47	2.34	2.20	1.53
*	3	104.7	11473	6.83	5.59	2.62	2.49	2.35	2.16	1.56
*	3	104.5	11453	6.83	5.59	2.61	2.49	2.35	2.18	1.56
*	3	104.8	11481	6.86	5.61	2.63	2.50	2.36	2.19	1.56
*	4	143.5	15727	9.24	7.56	3.48	3.30	3.12	2.87	2.04
*	4	143.9	15771	9.20	7.50	3.44	3.26	3.07	2.76	2.00
*	4	144.1	15791	9.24	7.55	3.50	3.30	3.12	2.80	2.06
*	4	144.5	15831	9.26	7.56	3.49	3.31	3.13	2.83	2.07

Stn:	34	Lane:J5	Temp:		J/C: 37	Air: 47	PvT: 54		12:47
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.9	11493	6.67	2.93	5.37	4.78	4.30	3.44	2.22
	C	105.3	11540	6.49	3.02	5.23	4.61	4.18	3.36	2.15
	C	104.8	11481	6.46	2.99	5.20	4.60	4.14	3.26	2.12
*	2	78.6	8616	4.98	2.24	4.01	3.54	3.19	2.64	1.69
*	2	79.2	8680	5.06	2.29	4.06	3.60	3.23	2.59	1.66
*	2	78.9	8644	5.00	2.28	4.02	3.55	3.20	2.54	1.63
*	2	79.1	8668	5.02	2.27	4.05	3.55	3.23	2.58	1.67
*	3	105.3	11532	6.52	3.05	5.25	4.63	4.20	3.39	2.17
*	3	105.2	11524	6.52	3.01	5.24	4.63	4.20	3.39	2.16
*	3	104.7	11469	6.45	2.97	5.18	4.57	4.11	3.27	2.06
*	3	105.0	11504	6.54	3.01	5.26	4.65	4.20	3.36	2.17
*	4	144.9	15870	8.64	4.03	6.94	6.15	5.54	4.51	2.87
*	4	145.0	15886	8.64	4.01	6.92	6.14	5.51	4.39	2.83
*	4	145.0	15882	8.72	4.06	6.98	6.20	5.56	4.43	2.85
*	4	145.1	15894	8.71	4.04	6.97	6.20	5.57	4.41	2.85

Stn:	50	Lane:J4	Temp:		J/C: 42	Air: 47	PvT: 57		12:49
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.4	11437	6.27	5.29	2.98	2.65	2.64	2.35	1.63
	C	104.8	11481	5.84	4.92	2.78	2.48	2.46	2.25	1.54
	C	104.6	11461	5.86	4.96	2.82	2.56	2.51	2.30	1.63
*	2	78.1	8553	4.34	3.66	2.11	1.88	1.88	1.67	1.18
*	2	78.8	8632	4.49	3.80	2.27	2.02	2.03	1.87V	1.33V
*	2	78.6	8612	4.39	3.70	2.16	1.89	1.91	1.74	1.21
*	2	78.7	8620	4.40	3.69	2.16	1.91	1.91	1.75	1.19
*	3	104.4	11437	5.84	4.92	2.79	2.51	2.48	2.15	1.58
*	3	104.8	11481	5.84	4.92	2.78	2.51	2.46	2.24	1.56
*	3	104.8	11485	5.86	4.94	2.80	2.52	2.48	2.27	1.57
*	3	104.5	11453	5.85	4.94	2.79	2.52	2.48	2.27	1.56
*	4	144.3	15811	8.19V	6.89V	4.02V	3.70V	3.60V	3.07V	2.32V
*	4	144.7	15850	8.00	6.72	3.69	3.39	3.27	2.83	2.12
*	4	144.9	15870	8.00	6.72	3.64	3.35	3.22V	2.77V	2.04
*	4	144.7	15850	7.94	6.65	3.65	3.33	3.24	2.79	2.06

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Stn:		53	Lane:J5	Temp:		J/C: 42	Air: 48		PvT: 55		12:52
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7	
	C	104.2	11413	6.16	2.98	5.13	4.63	4.19	3.43	2.30	
	C	104.0	11389	6.00	3.06	4.92	4.42	3.99	3.26	2.15	
	C	104.4	11433	5.91	2.93	4.83	4.34	3.89	3.15	2.06	
*	2	78.8	8632	4.55	2.25	3.74	3.35	3.02	2.49	1.61	
*	2	78.5	8597	4.54	2.22	3.72	3.33	3.02	2.48	1.59	
*	2	78.6	8616	4.57	2.24	3.76	3.39	3.03	2.46	1.63	
*	2	78.9	8640	4.60	2.26	3.78	3.39	3.06	2.50	1.61	
*	3	104.7	11473	5.98	3.06	4.93	4.42	4.00	3.25	2.15	
*	3	104.1	11409	6.06	3.10	4.98	4.48	4.04	3.29	2.17	
*	3	104.2	11413	6.15	3.22V	5.06	4.56	4.10	3.33	2.20	
*	3	104.2	11417	5.98	2.98	4.89	4.40	3.94	3.19	2.10	
*	4	143.6	15731	8.00	4.07	6.52	5.87	5.26	4.23	2.83	
*	4	144.1	15783	8.02	4.11	6.53	5.88	5.26	4.20	2.85	
*	4	143.8	15755	8.04	4.12	6.56	5.89	5.30	4.27	2.85	
*	4	144.1	15791	8.04	4.11	6.55	5.88	5.29	4.25	2.83	

Stn:		439	Lane:J4	Temp:		J/C: 40	Air: 48		PvT: 60		12:55
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7	
	C	105.6	11568	8.38	7.06	3.05	2.83	2.84	2.46	1.80	
	C	105.2	11524	7.69	6.46	2.89	2.70	2.69	2.34	1.74	
	C	105.0	11504	7.64	6.43	2.92	2.73	2.72	2.37	1.78	
*	2	79.0	8656	5.71	4.79	2.19	2.04	2.04	1.76	1.32	
*	2	79.2	8680	5.74	4.83	2.23	2.08	2.09	1.80	1.35	
*	2	79.2	8680	5.73	4.82	2.23	2.07	2.06	1.79	1.35	
*	2	79.3	8688	5.76	4.85	2.24	2.10	2.08	1.82	1.37	
*	3	105.0	11504	7.62	6.41	2.93	2.74	2.72	2.37	1.79	
*	3	105.5	11560	7.62	6.41	2.93	2.73	2.70	2.36	1.79	
*	3	105.5	11560	7.59	6.39	2.89	2.71	2.66	2.34	1.77	
*	3	105.0	11500	7.58	6.40	2.90	2.72	2.65	2.33	1.76	
*	4	145.0	15890	10.27	8.63	3.82	3.61	3.48	3.05	2.32	
*	4	145.4	15934	10.38	8.73	3.99	3.76V	3.65V	3.22	2.47	
*	4	145.4	15930	10.25	8.62	3.86	3.61	3.50	3.10	2.37	
*	4	145.6	15954	10.23	8.60	3.85	3.63	3.48	3.09	2.38	

Stn:		440	Lane:J5	Temp:		J/C: 40	Air: 48		PvT: 58		12:57
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7	
	C	105.0	11500	6.87	3.02	5.64	5.09	4.65	3.84	2.60	
	C	104.8	11481	6.61	3.12	5.42	4.89	4.44	3.68	2.51	
	C	104.8	11481	6.63	3.15	5.43	4.88	4.45	3.68	2.51	
*	2	78.6	8608	5.09	2.36	4.17	3.75	3.40	2.79	1.91	
*	2	78.7	8624	5.07	2.35	4.17	3.76	3.39	2.78	1.89	
*	2	78.6	8608	5.08	2.35	4.17	3.76	3.40	2.80	1.91	
*	2	78.9	8648	5.04	2.31	4.14	3.73	3.34	2.74	1.87	
*	3	105.1	11512	6.65	3.16	5.44	4.90	4.43	3.65	2.51	
*	3	104.9	11489	6.66	3.19	5.47	4.93	4.46	3.69	2.53	
*	3	104.8	11481	6.62	3.13	5.42	4.89	4.39	3.62	2.48	
*	3	104.8	11481	6.65	3.16	5.46	4.92	4.42	3.63	2.50	
*	4	144.9	15870	8.87	4.31	7.26	6.55	5.93	4.92	3.41	
*	4	145.1	15898	8.76	4.18	7.14	6.42	5.81	4.80	3.31	
*	4	145.1	15898	8.80	4.25	7.18	6.46	5.83	4.83	3.31	
*	4	144.9	15874	8.80	4.27	7.19	6.50	5.84	4.82	3.31	

Stn:		451	Lane:J4	Temp:		J/C: 38	Air: 48		PvT: 58		13:00
Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7	
	C	104.9	11497	7.62	6.36	3.01	2.84	2.72	2.42	1.86	
	C	104.4	11437	7.05	5.87	2.85	2.70	2.59	2.32	1.81	
	C	104.6	11457	7.03	5.85	2.85	2.70	2.57	2.31	1.81	
*	2	78.5	8601	5.33	4.46	2.20	2.09	2.01	1.80	1.42	
*	2	78.6	8616	5.35	4.46	2.20	2.08	1.99	1.78	1.40	
*	2	78.4	8585	5.34	4.46	2.20	2.07	2.02	1.79	1.40	
*	2	78.4	8593	5.33	4.45	2.19	2.06	2.02	1.78	1.40	
*	3	104.4	11437	7.04	5.86	2.84	2.69	2.58	2.32	1.81	
*	3	104.6	11457	7.11	5.91	2.91	2.76	2.65	2.38	1.88	
*	3	104.5	11453	7.11	5.91	2.89	2.73	2.63	2.35	1.85	
*	3	104.6	11465	7.09	5.91	2.89	2.73	2.62	2.35	1.85	
*	4	144.6	15846	9.59	7.96	3.81	3.61	3.44	3.11	2.42	
*	4	144.7	15858	9.56	7.94	3.80	3.63	3.46	3.10	2.41	
*	4	145.5	15939	9.57	7.96	3.81	3.61	3.47	3.10	2.41	

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*	4	144.7	15858	9.58	7.97	3.85	3.65	3.48	3.12	2.44

Stn: 453 Lane:J5 Temp: J/C: 38 Air: 47 PvT: 57 13:02

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.3	11429	7.45	3.13	6.07	5.46	5.02	4.13	2.80
	C	104.5	11449	7.23	3.19	5.91	5.31	4.85	4.00	2.74
	C	104.2	11413	7.19	3.16	5.88	5.28	4.83	3.98	2.72
*	2	78.7	8620	5.59	2.38	4.56	4.09	3.76	3.11	2.10
*	2	78.3	8581	5.51	2.30	4.48	4.01	3.68	3.04	2.05
*	2	78.1	8561	5.55	2.33	4.52	4.06	3.72	3.07	2.06
*	2	78.6	8608	5.61	2.39	4.56	4.10	3.76	3.11	2.10
*	3	104.1	11405	7.20	3.15	5.89	5.28	4.84	3.98	2.72
*	3	104.2	11413	7.23	3.16	5.91	5.30	4.84	3.98	2.72
*	3	104.2	11413	7.28	3.20	5.94	5.33	4.88	4.02	2.78
*	3	104.1	11401	7.23	3.18	5.89	5.29	4.82	3.96	2.70
*	4	143.9	15763	9.50	4.25	7.72	6.93	6.35	5.24	3.58
*	4	144.3	15811	9.75	4.47V	7.94	7.14	6.57V	5.42V	3.75
*	4	144.2	15795	9.57	4.32	7.76	6.96	6.38	5.25	3.61
*	4	144.1	15791	9.56	4.29	7.75	6.95	6.37	5.25	3.60

Stn: 468 Lane:J4 Temp: J/C: 41 Air: 49 PvT: 57 13:05

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.1	11401	8.15	6.80	2.81	2.61	2.51	2.22	1.70
	C	104.1	11405	7.69	6.41	2.62	2.45	2.35	2.08	1.59
	C	104.4	11441	7.69	6.43	2.72	2.56	2.45	2.15	1.69
*	2	78.3	8577	5.85	4.86	2.05	1.91	1.85	1.63	1.27
*	2	78.1	8561	5.85	4.87	2.07	1.93	1.85	1.63	1.28
*	2	78.3	8581	5.88	4.89	2.07	1.94	1.86	1.66	1.28
*	2	78.4	8593	5.81	4.84	2.02	1.88	1.81	1.63	1.23
*	3	103.7	11361	7.76	6.48	2.84V	2.67V	2.57V	2.28V	1.78
*	3	104.3	11425	7.73	6.46	2.71	2.55	2.43	2.17	1.65
*	3	103.8	11377	7.65	6.41	2.66	2.50	2.39	2.12	1.64
*	3	104.1	11405	7.70	6.45	2.72	2.56	2.44	2.18	1.68
*	4	143.9	15771	10.31	8.61	3.61	3.41	3.24	2.89	2.26
*	4	145.2	15910	10.26	8.54	3.54	3.34	3.19	2.87	2.18
*	4	144.7	15850	10.28	8.57	3.57	3.37	3.22	2.85	2.22
*	4	144.5	15835	10.27	8.57	3.58	3.38	3.23	2.88	2.24

Stn: 470 Lane:J5 Temp: J/C: 41 Air: 50 PvT: 57 13:07

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	103.5	11342	9.30	3.15	7.67	6.88	6.19	5.01	3.09
	C	103.5	11338	9.04	3.22	7.43	6.65	5.98	4.82	2.98
	C	104.2	11413	9.05	3.24	7.42	6.65	5.96	4.81	2.96
*	2	77.7	8513	7.19	2.32	5.88	5.25	4.72	3.81	2.33
*	2	77.7	8513	7.23	2.34	5.90	5.28	4.73	3.83	2.35
*	2	78.1	8553	7.25	2.33	5.91	5.29	4.74	3.84	2.34
*	2	77.7	8513	7.24	2.36	5.91	5.29	4.74	3.85	2.35
*	3	103.2	11306	8.98	3.23	7.39	6.61	5.94	4.80	2.98
*	3	104.0	11389	9.04	3.24	7.41	6.64	5.96	4.82	2.97
*	3	103.9	11381	9.06	3.26	7.43	6.66	5.98	4.83	2.99
*	3	103.9	11381	9.06	3.26	7.43	6.67	5.98	4.84	2.97
*	4	143.9	15767	11.61	4.54	9.52	8.54	7.68	6.20	3.83
*	4	144.3	15815	11.64	4.54	9.52	8.54	7.67	6.20	3.80
*	4	144.1	15783	11.67	4.56	9.54	8.56	7.67	6.21	3.82
*	4	144.4	15823	11.68	4.56	9.56	8.56	7.70	6.21	3.82

Stn: 486 Lane:J4 Temp: J/C: 40 Air: 49 PvT: 59 13:09

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.6	11457	7.45	6.21	2.49	2.38	2.29	2.24	1.71
	C	104.6	11461	6.90	5.75	2.40	2.29	2.19	2.08	1.61
	C	104.5	11445	6.87	5.72	2.41	2.29	2.19	2.04	1.60
*	2	78.5	8597	5.19	4.31	1.81	1.73	1.67	1.64	1.26
*	2	78.4	8585	5.17	4.32	1.82	1.74	1.69	1.78V	1.34
*	2	78.5	8597	5.18	4.32	1.82	1.74	1.68	1.65	1.24
*	2	78.5	8601	5.20	4.32	1.82	1.73	1.67	1.62	1.24
*	3	104.4	11437	6.87	5.72	2.42	2.30	2.20	2.06	1.57
*	3	105.1	11516	6.88	5.74	2.43	2.30	2.20	2.02	1.57
*	3	104.6	11461	6.89	5.74	2.43	2.31	2.20	2.05	1.61
*	3	104.7	11469	6.89	5.74	2.42	2.30	2.20	2.07	1.62
*	4	145.2	15914	9.38	7.81	3.28	3.12	2.97	2.73	2.11
*	4	145.1	15894	9.33	7.75	3.25	3.12	2.95	2.76	2.15

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*	4	145.7	15962	9.32	7.75	3.24	3.09	2.95	2.73	2.14
*	4	145.2	15914	9.31	7.74	3.24	3.08	2.96	2.68	2.11

Stn: 488 Lane:J5 Temp: J/C: 40 Air: 49 PvT: 58 13:12

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	103.8	11377	9.18	2.70	7.45	6.64	5.96	4.80	3.08
	C	103.7	11357	9.04	2.81	7.30	6.52	5.85	4.69	3.05
	C	103.9	11381	9.11	2.91	7.39	6.59	5.92	4.72	3.07
*	2	78.0	8549	7.14	1.87V	5.71V	5.06V	4.51V	3.64V	2.21V
*	2	77.7	8509	7.30	2.00	5.86	5.22	4.67	3.80	2.39
*	2	77.8	8529	7.38	2.09	5.94	5.29	4.74	3.82	2.44
*	2	77.9	8537	7.29	2.00	5.87	5.22	4.67	3.76	2.40
*	3	103.6	11354	9.01	2.81	7.30	6.50	5.83	4.70	3.01
*	3	104.0	11397	9.09	2.82	7.35	6.53	5.88	4.63	3.02
*	3	103.6	11350	9.11	2.82	7.36	6.54	5.88	4.67	3.03
*	3	103.8	11369	9.11	2.83	7.36	6.54	5.89	4.66	3.03
*	4	143.9	15763	11.47	4.00	9.28	8.27	7.44	5.95	3.86
*	4	144.3	15807	11.55	4.02	9.33	8.31	7.48	6.00	3.88
*	4	144.6	15842	11.58	4.02	9.35	8.33	7.49	6.04	3.88
*	4	144.3	15815	11.60	4.03	9.38	8.35	7.52	6.04	3.90

Stn: 499 Lane:J4 Temp: J/C: 39 Air: 48 PvT: 60 13:14

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	105.1	11516	6.79	5.65	2.66	2.56	2.48	2.23	1.74
	C	104.9	11493	6.28	5.25	2.59	2.47	2.39	2.15	1.67
	C	104.9	11489	6.27	5.22	2.57	2.46	2.37	2.15	1.69
*	2	78.8	8628	4.68	3.93	1.95	1.87	1.79	1.61	1.24
*	2	79.1	8664	4.69	3.95	2.00	1.91	1.81	1.65	1.27
*	2	78.8	8636	4.59	3.89	1.89	1.79	1.71	1.54	1.16
*	2	78.7	8620	4.71	3.95	1.96	1.88	1.82	1.65	1.28
*	3	104.6	11465	6.30	5.24	2.58	2.47	2.38	2.13	1.68
*	3	105.0	11508	6.33	5.26	2.59	2.48	2.39	2.16	1.69
*	3	104.9	11497	6.35	5.28	2.62	2.50	2.39	2.15	1.68
*	3	105.0	11504	6.38	5.32	2.65	2.54	2.44	2.21	1.79
*	4	145.1	15898	8.66	7.19	3.48	3.35	3.21	2.88	2.26
*	4	145.9	15985	8.70	7.23	3.54	3.37	3.23	2.93	2.31
*	4	145.6	15950	8.68	7.21	3.51	3.36	3.23	2.88	2.26
*	4	145.5	15946	8.63	7.17	3.46	3.30	3.17	2.85	2.26

Stn: 501 Lane:J5 Temp: J/C: 39 Air: 50 PvT: 60 13:16

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.6	11461	7.52	2.80	6.06	5.37	4.81	3.83	2.55
	C	104.8	11481	7.36	2.91	5.93	5.27	4.74	3.84	2.56
	C	104.5	11453	7.29	2.84	5.88	5.22	4.69	3.79	2.52
*	2	78.6	8612	5.73	2.11	4.61	4.10	3.69	3.02	2.00
*	2	78.3	8577	5.73	2.09	4.61	4.09	3.68	2.98	1.98
*	2	78.4	8593	5.74	2.11	4.61	4.09	3.69	2.99	2.00
*	2	78.5	8601	5.77	2.11	4.62	4.10	3.69	3.00	1.99
*	3	104.7	11469	7.32	2.83	5.91	5.24	4.72	3.81	2.50
*	3	104.6	11465	7.33	2.83	5.90	5.23	4.70	3.78	2.49
*	3	104.8	11485	7.35	2.83	5.90	5.24	4.70	3.78	2.51
*	3	104.6	11457	7.33	2.81	5.90	5.24	4.71	3.80	2.50
*	4	144.5	15827	9.52	3.90	7.65	6.80	6.13	4.92	3.26
*	4	144.9	15878	9.54	3.88	7.67	6.80	6.13	4.95	3.27
*	4	144.7	15854	9.59	3.92	7.70	6.84	6.16	4.96	3.30
*	4	145.0	15882	9.64	3.93	7.74	6.87	6.20	5.02	3.33

Stn: 513 Lane:J4 Temp: J/C: 40 Air: 49 PvT: 60 13:19

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.0	11397	6.85	5.76	2.82	2.61	2.54	2.33	1.77
	C	104.2	11421	6.53	5.50	2.79	2.58	2.51	2.31	1.76
	C	104.0	11393	6.53	5.51	2.74	2.55	2.46	2.24	1.72
*	2	78.1	8561	4.91	4.15	2.11	1.92	1.89	1.77	1.31
*	2	78.3	8581	4.94	4.16	2.14	1.95	1.94	1.82	1.37
*	2	78.2	8569	4.82	4.04	2.00	1.82	1.81	1.70	1.28
*	2	78.6	8612	4.81	4.03	1.98	1.80	1.79	1.67	1.26
*	3	104.7	11473	6.54	5.51	2.79	2.60	2.53	2.30	1.79
*	3	104.6	11457	6.50	5.44	2.69	2.49	2.42	2.21	1.68
*	3	104.3	11429	6.52	5.49	2.76	2.57	2.50	2.30	1.78
*	3	104.3	11425	6.50	5.47	2.73	2.55	2.45	2.24	1.72
*	4	145.1	15894	8.80	7.41	3.64	3.40	3.28	2.98	2.30

File: C:\FWD\DATA\313018C3.FWD
Road: I-80 WESTBOUND 1 MILE EAST OF KEARNY NEBRASKA
Subsection: 313018

*	4	143.9	15771	8.70	7.31	3.57	3.32	3.22	2.92	2.24
*	4	144.1	15791	8.74	7.35	3.62	3.39	3.27	2.94	2.28
*	4	143.9	15771	8.74	7.36	3.63	3.36	3.29	2.98	2.32

Stn: 515 Lane:J5 Temp: J/C: 40 Air: 49 PvT: 60 13:21

Sto	Hgt	psi	lbf	Df1	Df2	Df3	Df4	Df5	Df6	Df7
	C	104.4	11441	6.53	3.02	5.47	5.01	4.53	3.76	2.48
	C	103.9	11381	6.37	3.09	5.32	4.86	4.41	3.64	2.44
	C	104.0	11393	6.36	3.11	5.31	4.85	4.40	3.65	2.44
*	2	78.1	8561	5.12	2.34	4.24	3.92	3.52	2.98	1.94
*	2	78.1	8557	5.06	2.29	4.19	3.84	3.47	2.92	1.90
*	2	78.3	8577	5.04	2.28	4.17	3.85	3.46	2.93	1.90
*	2	78.1	8561	5.06	2.28	4.18	3.86	3.47	2.92	1.89
*	3	104.1	11405	6.33	3.11	5.30	4.84	4.38	3.65	2.41
*	3	104.1	11409	6.35	3.13	5.29	4.84	4.39	3.63	2.43
*	3	104.1	11409	6.35	3.14	5.31	4.85	4.39	3.65	2.43
*	3	104.3	11425	6.37	3.15	5.30	4.86	4.40	3.67	2.44
*	4	143.3	15699	8.05	4.52	6.73	6.20	5.60	4.69	3.13
*	4	144.4	15823	8.11	4.58	6.78	6.24	5.65	4.75	3.20
*	4	144.3	15811	8.11	4.60	6.76	6.19	5.63	4.72	3.17
*	4	143.9	15767	8.10	4.59	6.75	6.17	5.61	4.70	3.16

Mileage:-.006 -> .098

Summary of Data for section 313018C
Analyzed by: Bob Van Sambeek on 07-11-1995

UNCORRECTED Overall Deflection Statistics

Mean Values (mils/kip)

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	2	0.3231	0.3035	0.2989	0.2857	0.2747	0.2459	0.1777
	3	0.3252	0.3067	0.3004	0.2873	0.2758	0.2464	0.1787
	4	0.3168	0.2994	0.2926	0.2799	0.2679	0.2393	0.1744

Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	2	0.0332	0.0278	0.0278	0.0273	0.0257	0.0232	0.0199
	3	0.0313	0.0272	0.0266	0.0261	0.0246	0.0224	0.0208
	4	0.0284	0.0253	0.0247	0.0245	0.0233	0.0216	0.0211

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	2	10.27%	9.14%	9.31%	9.57%	9.36%	9.44%	11.20%
	3	9.62%	8.86%	8.86%	9.10%	8.93%	9.11%	11.62%
	4	8.98%	8.44%	8.44%	8.75%	8.69%	9.01%	12.07%

Rigid Pavement Deflection Statistics - 313018C

Mean Values (mils/kip)

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	2	0.3231	0.3035	0.2989	0.2857	0.2747	0.2459	0.1777
	3	0.3252	0.3067	0.3004	0.2873	0.2758	0.2464	0.1787
	4	0.3168	0.2994	0.2926	0.2799	0.2679	0.2393	0.1744

Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	2	0.0332	0.0278	0.0278	0.0273	0.0257	0.0232	0.0199
	3	0.0313	0.0272	0.0266	0.0261	0.0246	0.0224	0.0208
	4	0.0284	0.0253	0.0247	0.0245	0.0233	0.0216	0.0211

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	2	10.27%	9.14%	9.31%	9.57%	9.36%	9.44%	11.20%
	3	9.62%	8.86%	8.86%	9.10%	8.93%	9.11%	11.62%
	4	8.98%	8.44%	8.44%	8.75%	8.69%	9.01%	12.07%

Outlier Statistics - 313018C

Station	Height	Sensor	Number of Std. Dev.

No deflection data for this subsection is more than 2.0 standard deviations from the subsection mean.

Pavement Construction Information - 313018C

Material Code	Material Name	Layer Thickness
730	Portland Cement Concrete	12.0
339	Soil Cement	5.0

RIGID Pavement Thickness Data - 313018C
(comparison of each calculation to the expected value)

Minimum expected thickness: 7.80
Maximum expected thickness: 13.80

Height	Station	Effective Thickness

No predicted thickness values fall outside the expected range...

RIGID Pavement Thickness Statistics - 313018C

Drop height 2

Subsection	Station	Volumetric k	Effective Thickness
No test pit data found, therefore no results exist...			
1	-23	347	11.00
	-5	330	11.00
	9	328	10.25
	23	307	10.63
	40	353	11.00
	59	327	10.63
	443	300	9.50
	457	266	9.88
	473	274	9.88
	491	280	10.25
	506	272	10.63
	521	298	10.63
Subsection 1 Overall Mean:		307	10.44
Standard Deviation:		30	0.49
Coeff Of Variation:		9.78%	4.72%

RIGID Pavement Thickness Statistics - 313018C

Drop height 3

Subsection	Station	Volumetric k	Effective Thickness
No test pit data found, therefore no results exist...			
1	-23	336	10.63
	-5	340	11.00
	9	327	10.25
	23	308	10.63
	40	340	11.00
	59	329	10.63
	443	303	9.50
	457	265	9.88
	473	271	9.88
	491	283	10.25
	506	266	10.63
	521	298	10.63
Subsection 1 Overall Mean:		305	10.41
Standard Deviation:		29	0.47
Coeff Of Variation:		9.47%	4.47%

RIGID Pavement Thickness Statistics - 313018C

Drop height 4

Subsection	Station	Volumetric k	Effective Thickness
No test pit data found, therefore no results exist...			
1	-23	347	11.00
	-5	349	11.00
	9	344	10.25
	23	315	11.00
	40	350	11.00
	59	329	10.63
	443	316	9.88
	457	273	10.25
	473	282	9.88
	491	287	10.25
	506	273	10.63
	521	302	10.63
Subsection 1 Overall Mean:		314	10.53
Standard Deviation:		30	0.43
Coeff Of Variation:		9.63%	4.05%

Summary of Results

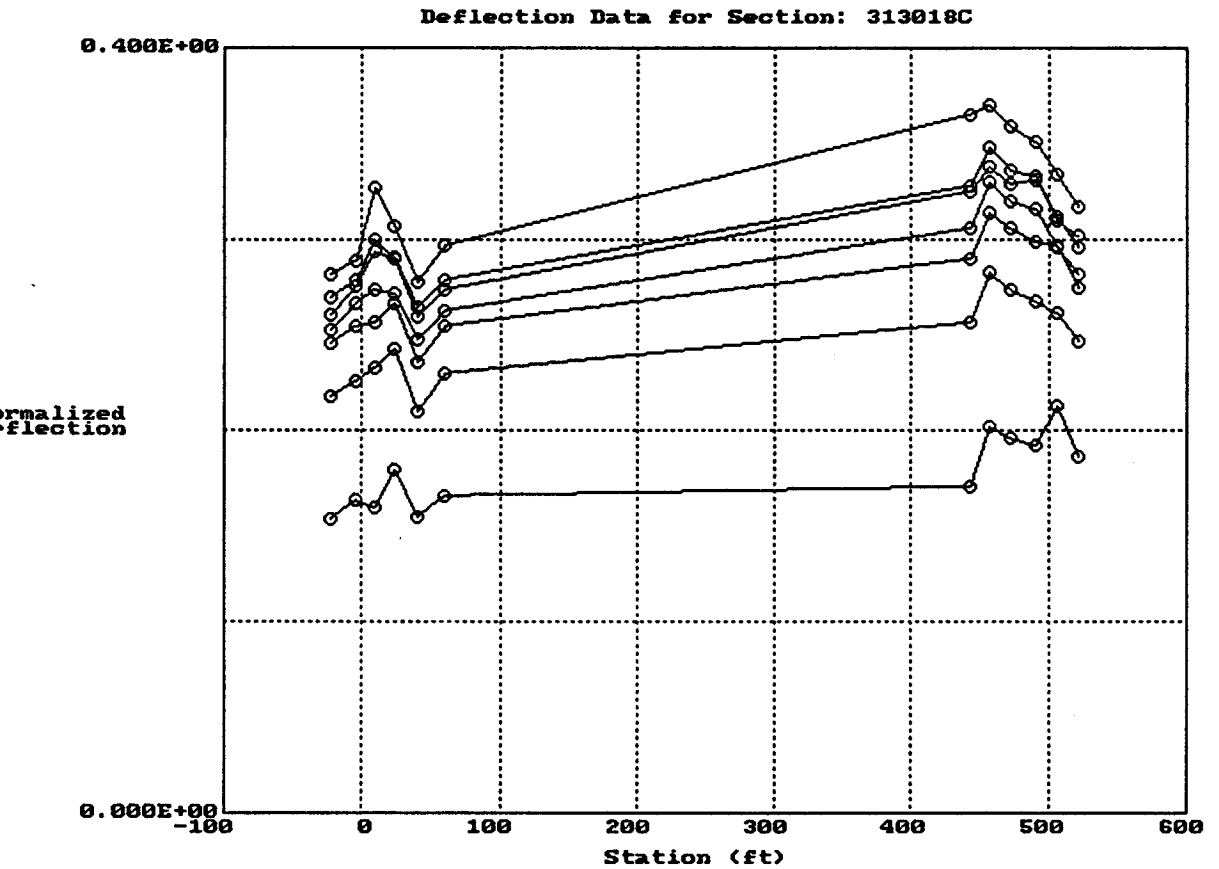
Section uniformity:
NO Subsections were identified within the section.

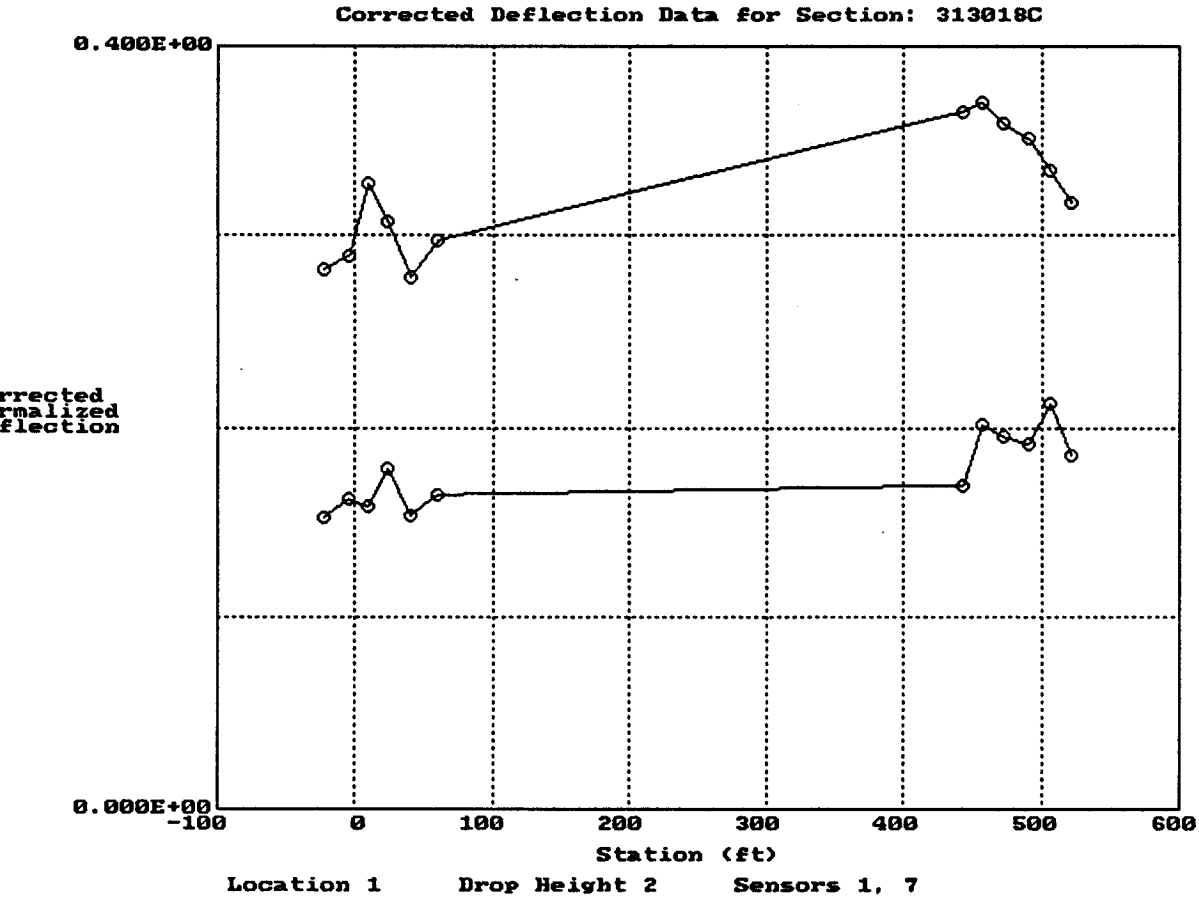
Outliers - Test pits: 21 combinations at each test pit
NO Test pit data was present.

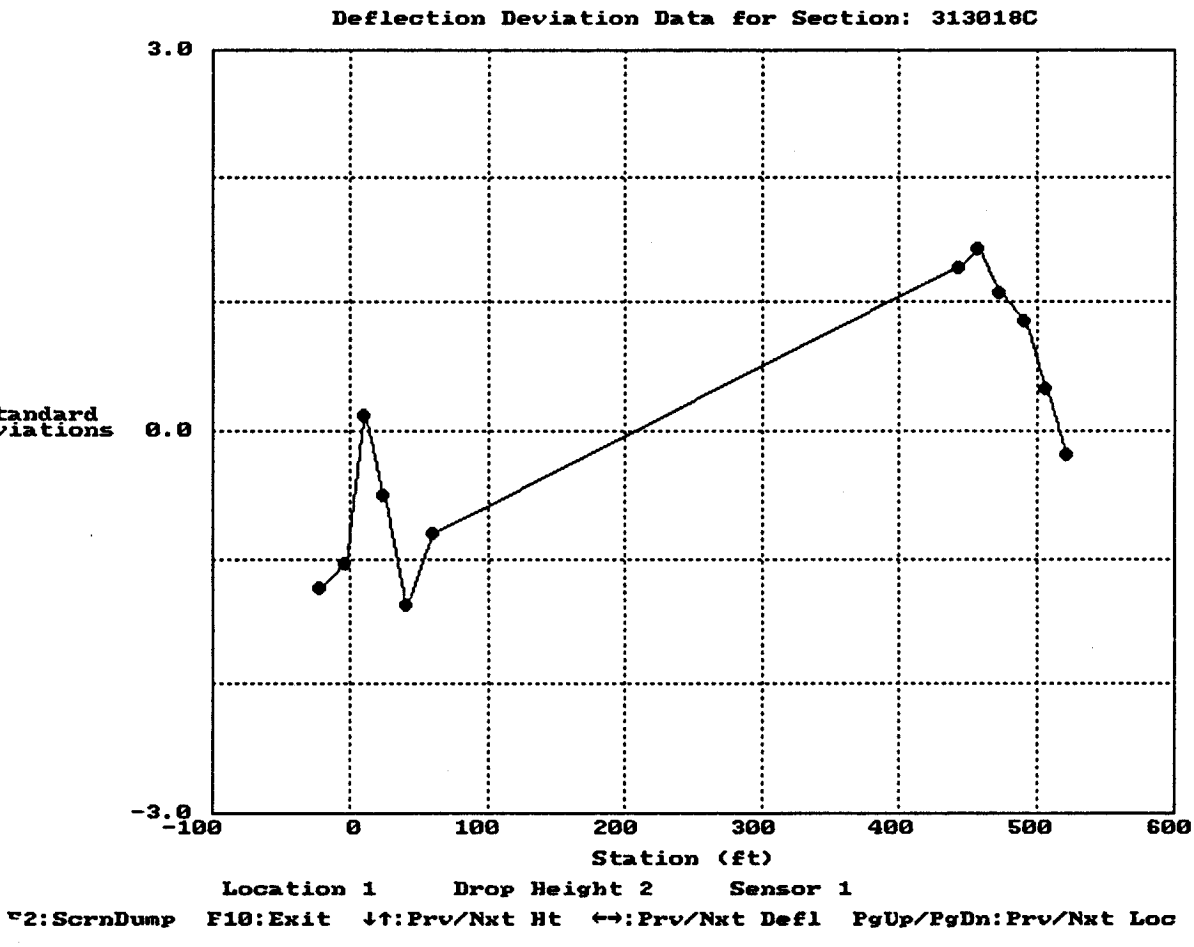
Outliers - Section data: 252 total combinations within the section
There are NO data outliers within the section data.

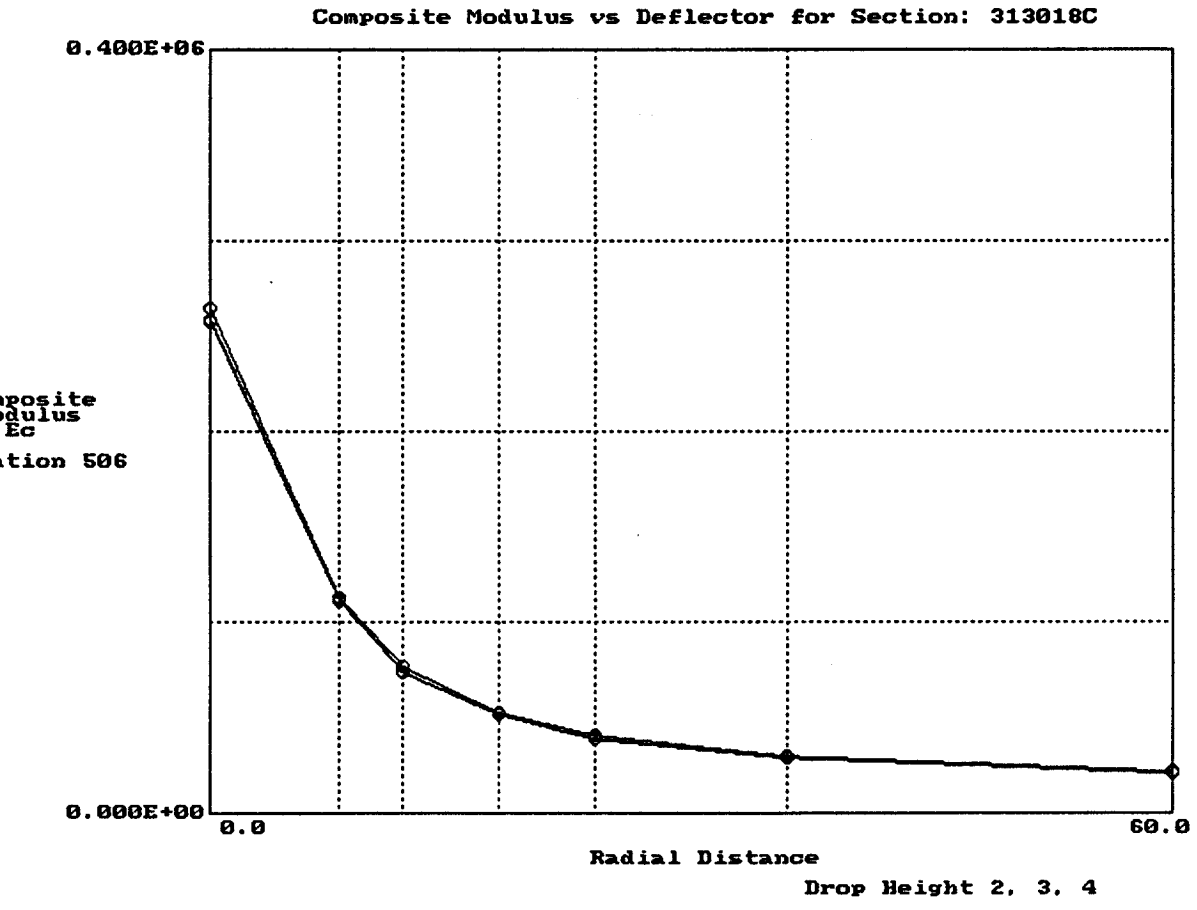
Structural capacity - Test pits: 3 combinations at each test pit
All results for TP 1 are within the range of expected values.
All results for TP 2 are within the range of expected values.

Structural capacity - Section data: 36 total combinations within the section
All results are within the range of expected values.

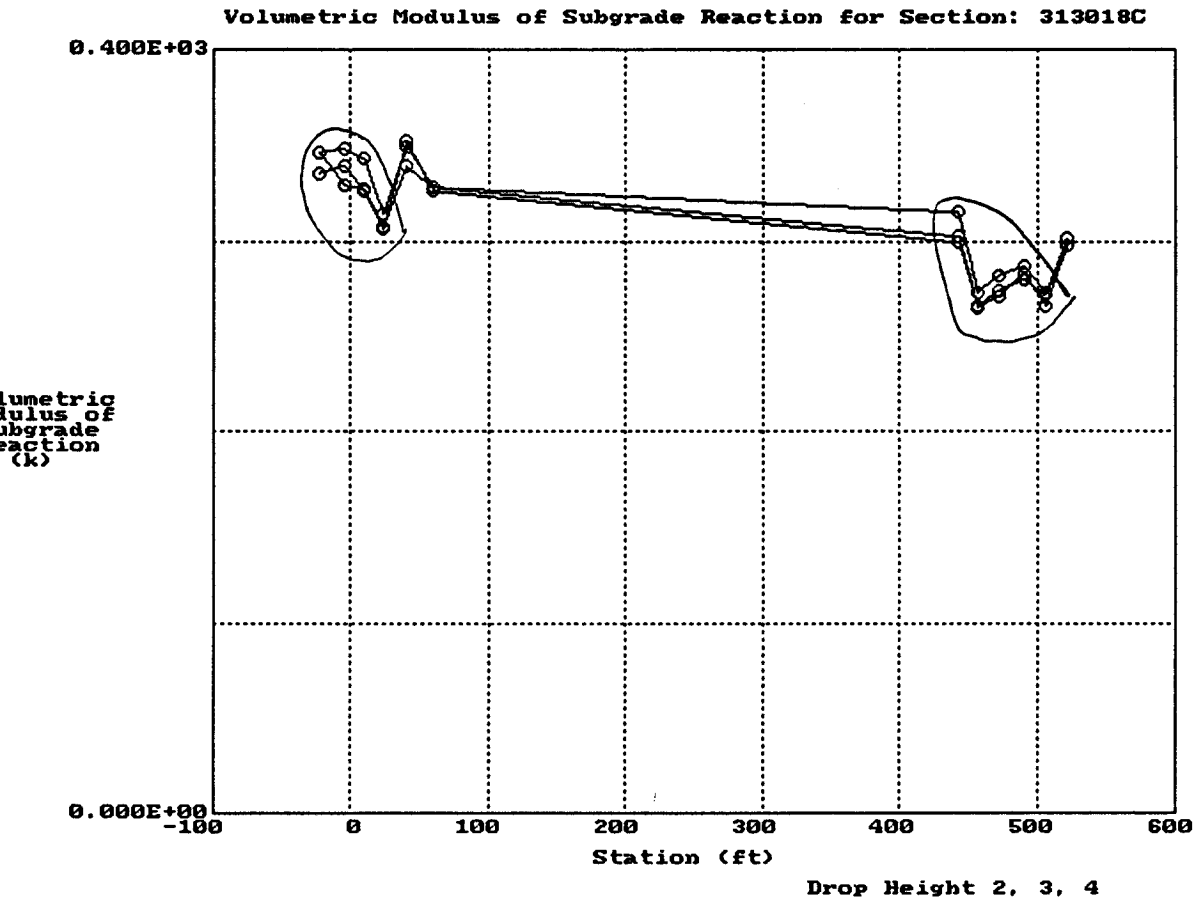

Deflection Data for Section: 313018C
0.400E+00
rmalized
flection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
Location 1 Drop Height 2 Sensors 1, 2, 3, 4, 5, 6, 7
F2:ScrnDump F10:Exit ↓↑:Prv/Nxt Ht PgUp/PgDn:Prv/Nxt Loc

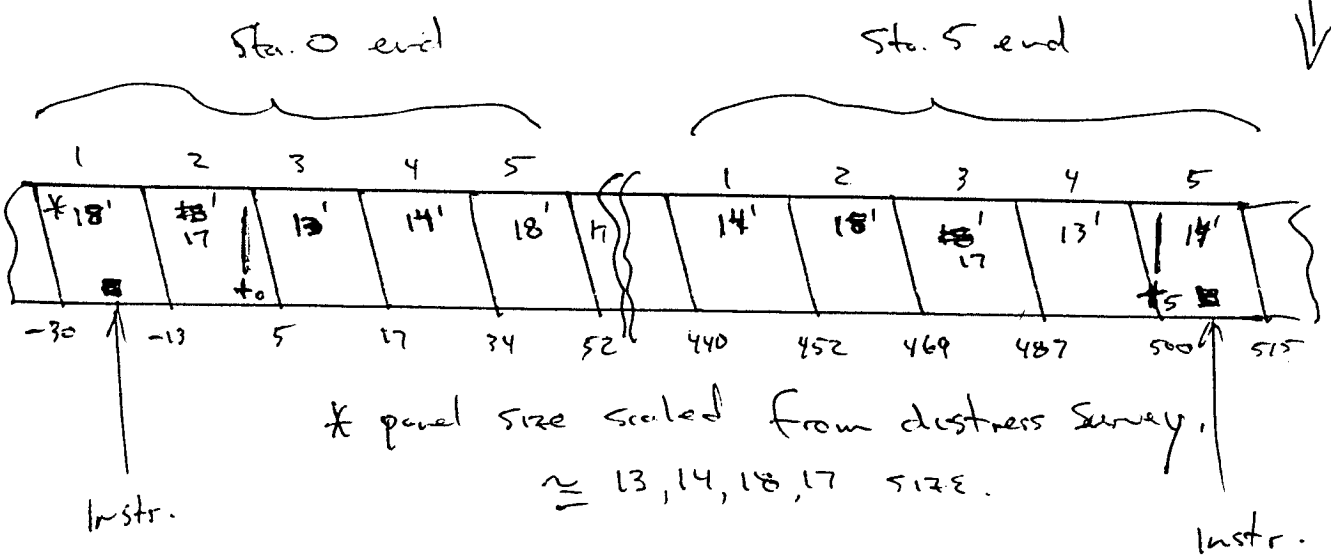

Corrected Deflection Data for Section: 313018C
0.400E+00
rrected
rmalized
flection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
Location 1 Drop Height 2 Sensors 1, 7
F2:ScrnDump F10:Exit ↓↑:Prv/Nxt Ht PgUp/PgDn:Prv/Nxt Loc


Deflection Deviation Data for Section: 313018C
3.0
tandard
viations
0.0
-3.0
-100
0
100
200
300
400
500
600
Station (ft)
Location 1
Drop Height 2
Sensor 1
F2:ScrnDump
F10:Exit
↓↑:Prv/Nxt Ht
↔:Prv/Nxt Defl
PgUp/PgDn:Prv/Nxt Loc



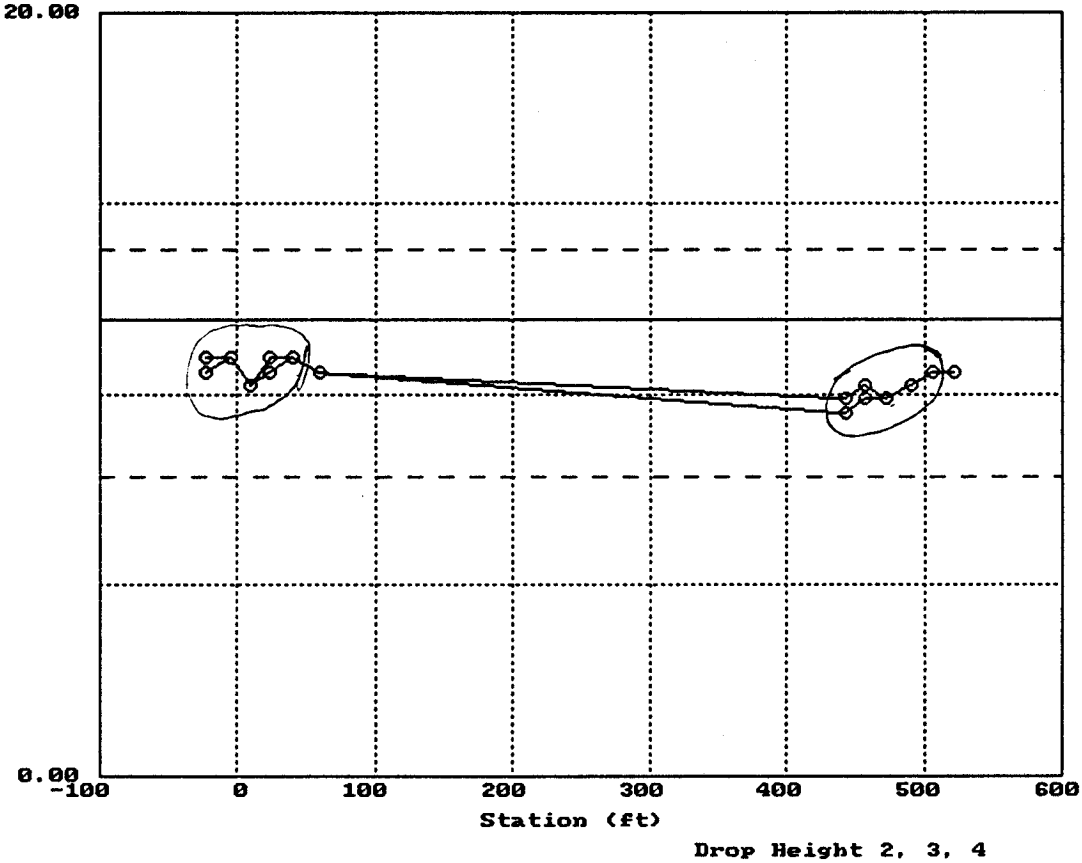
F10:ExitPlots Home End PgUp PgDn





* panel size scaled from distress survey.
≃ 13, 14, 18, 17 size.

Westergaard based Rigid Thickness for Section: 313018C



fective
Rigid
avement
ickness

Drop Height 2, 3, 4

F10:ExitPlots

SETUP:
Spatial Filter Wavelength.. 300.0 Speed...51.00 (mph)
Start Method..... PHOTOCELL
Stop Method.....
Wavelength Initialization.. DISABLED

SURVEY:
GPS 313018
Oper/Driver.. DRS
Date..... 22/08/1994
Time..... 12:29:18
Station..... 0 - 500

LOCATION:
Begin..... MP-274.57
End..... MP=-274.48
Lane..... OSL
Direction.. WEST
Horizontal
Offset... 3-FT

CONDITIONS:
Pavement
Road..... IH-80
Surface Mat'l. P-CC
Surface Cond.. GOOD
Weather
Temperature... 85 F
Cloud..... CLEAR
Other.....

PROFCHK SUMMARY REPORT

Wednesday, July 19, 1995 17:25:12

313018

RUN #	INTERVAL (ft)		IRI (in/mi) LEFT	IRI (in/mi) RIGHT	IRI (in/mi) BOTH	DISPLACEMENT (in)
			Included in statistics: Yes			
1	0	-100	106.80	115.75	111.28	2.09
	100	-200	102.63	90.49	96.56	1.82
	200	-300	106.57	92.63	99.60	1.88
	300	-400	104.92	111.64	108.28	2.04
	400	-500	88.43	94.92	91.67	1.73
	0-500		101.85	100.76	101.30	9.58
			Included in statistics: Yes			
2	0	-100	101.93	117.09	109.51	2.05
	100	-200	101.24	89.33	95.29	1.80
	200	-300	104.99	90.10	97.55	1.84
	300	-400	106.40	110.19	108.29	2.04
	400	-500	87.12	92.86	89.99	1.70
	0-500		100.37	99.64	100.00	9.46
			Included in statistics: Yes			
3	0	-100	104.45	114.92	109.69	2.06
	100	-200	104.19	90.18	97.18	1.83
	200	-300	98.69	95.39	97.04	1.83
	300	-400	102.06	110.48	106.27	2.00
	400	-500	90.15	92.73	91.44	1.72
	0-500		99.94	100.53	100.24	9.48
			Included in statistics: Yes			
4	0	-100	101.12	113.79	107.46	2.01
	100	-200	103.31	85.13	94.22	1.78
	200	-300	96.57	94.20	95.39	1.80
	300	-400	100.92	111.42	106.17	2.00
	400	-500	93.80	95.59	94.70	1.78
	0-500		99.11	99.77	99.44	9.41
			Included in statistics: Yes			
5	0	-100	100.36	112.66	106.51	2.00
	100	-200	101.97	86.61	94.29	1.78
	200	-300	98.82	93.14	95.98	1.81
	300	-400	101.79	107.24	104.52	1.97
	400	-500	91.38	96.23	93.80	1.77
	0-500		98.88	98.94	98.91	9.36
			Included in statistics: Yes			
6	0	-100	102.25	112.56	107.40	2.01
	100	-200	103.85	92.18	98.01	1.85
	200	-300	97.95	95.66	96.80	1.82

PROFCHK SUMMARY REPORT

Wednesday, July 19, 1995 17:25:12

313018

RUN #	INTERVAL (ft)		----- IRI (in/mi) ----- LEFT	RIGHT	BOTH	DISPLACEMENT (in)
	300	-400	105.67	111.52	108.60	2.05
	400	-500	86.76	97.72	92.24	1.74
	0-500		99.30	101.79	100.54	9.51
	Included in statistics: Yes					
7	0	-100	100.54	115.09	107.82	2.02
	100	-200	105.45	90.49	97.97	1.85
	200	-300	99.47	94.80	97.14	1.83
	300	-400	102.52	112.75	107.63	2.03
	400	-500	92.34	95.97	94.16	1.77
	0-500		100.11	101.55	100.83	9.54
	Included in statistics: Yes					
8	0	-100	103.08	118.06	110.57	2.07
	100	-200	106.33	91.26	98.80	1.86
	200	-300	98.66	96.25	97.46	1.84
	300	-400	109.37	110.68	110.02	2.07
	400	-500	85.25	97.57	91.41	1.72
	0-500		100.53	102.49	101.51	9.60
	Included in statistics: Yes					
9	0	-100	105.27	115.04	110.15	2.07
	100	-200	108.36	91.02	99.69	1.88
	200	-300	105.45	93.26	99.36	1.87
	300	-400	107.41	111.46	109.44	2.06
	400	-500	90.29	93.33	91.81	1.73
	0-500		103.39	100.56	101.97	9.65

REMARKS

GPS 313018
End of run comment
Additional Operator comment

Run	RCO comment	RCO Code
1	GOOD RUN	
2	GOOD RUN	
3	GOOD RUN	
4	GOOD RUN	
5	GOOD RUN	
6	GOOD RUN	
7	GOOD RUN	
8	GOOD RUN	
9	GOOD RUN	

RCO Codes: 1 - Anomaly 2 - Equipment related 3 - Unexplained

	IRI (in/mi)		
	LEFT	RIGHT	BOTH
Minimum	98.88		98.91
Maximum	103.39		101.97
Mean + 1%	101.39	101.67	101.53
Mean	100.39	100.67	100.53
Mean - 1%	99.38	99.66	99.52
Std. Deviation	1.36	1.07	0.94
2 % of Mean	2.00	2.01	2.01
Coef. of Vari.	1.35	1.06	0.93

Appendix B-1: Pre-Installation Site Recruitment and Coordination Information

Appendix B-1 contains the following pre-installation site recruitment and coordination information:

- SMP site recruitment notes;
- Pre-installation meeting agenda, list of participants, and notes; and
- Site visit field notes.

313018

STATE OF NEBRASKA

DEPARTMENT OF ROADS
G. C. Strobel, *Director*
1 Nebraska Hwy 2
Box 94759
Lincoln NE 68509-4759
Phone (402) 471-4567
FAX (402) 479-4325

1-15-91 & Copy to Byrum

July 5, 1991

E. Benjamin Nelson
Governor

Mr. Richard Ingberg
Regional Engineer
Strategic Highway Research Program
1404 Concordia Avenue
St. Paul, MN 55104

Re: Seasonal Monitoring of SHRP GPS Sections

Nebraska can participate in the seasonal monitoring project outlined in your letter of June 26, 1991. This will involve GPS section 311030 on US-6 east of Arapahoe.

For traffic control purposes, we will need at least 48 hours prior notice before a monitoring visit. Also, all monitoring activities will have to be completed during daylight hours.

We look forward to working with you on this project.

Sincerely,

Thomas A Wais

Thomas A. Wais
Deputy Director - Planning

TAW/GW/bt

xc: J. Orrell
G. Woolstrum

DROPPED IN 1995.
- not lost 6 years
(Till 2000)

Memorandum

Date: April 4, 1995

To: Gene Skok, Ron Urbach

From: Robert Van Sambeek RVS

Re: Potential SMP Sites and AWS Installations in Nebraska.
C:\SMP\WP\NB1995.SMP

AWS - easy things first. At the project, please look up, down, and all around at potential AWS installation locations. Usual concerns with obstructions, overhead utilities, etc. as described in LTPP Directive AWS-1 (copy attached).

- Combine WIM and AWS in expanded fence (AWS require 20'X20')? Expand to 20'X30' to keep 4X the height from WIM cabinet as an obstruction? Prevailing wind direction critical if obstructions exist. Both require 120 VAC power?

SMP - the potential SMP sites identified in Nebraska are listed below according to the SMP experimental cell. At this point, the program could use all four sites listed if the DOT is interested. Realistically expect two sites based on the additional discussion below.

SMP Cell 11 - Dry, Freeze, Fine Subgrade, and Thick AC Pavement

311030 on US-6 east of Arapahoe.
- This section was monitored in the pilot testing done for SHRP (Sta 0-34 to 2+00).
- Biggest concern is the age of the surface (constructed in 1982) regarding maintenance in the next six to ten years.
- Another concern is with two-way traffic requiring flagging operation for lane closures. On one previous visit, the traffic control had to come from the next district because of staff limitations.

310114 is the 7.0 inch AC on 12.0 inch DGAB section on the SPS-1 project.
- Scheduled for completion this summer.

My preference is to use the SPS-1 site in order to get additional environmental data for the project that the AWS does not collect (pavement, base, and subgrade temperatures; base and subgrade moisture contents; and frost/thaw depths). However, both sites can be included if the DOT is willing to provide the traffic control 14 times every other year, as well as, the materials and support for installation of the sites.

SMP Cell 23 - Dry, Freeze, Coarse Subgrade, and JPC Pavement

313018 on IH-80.
- Constructed 1985.
- Concern with AADT of about 10,000.
- Any planned maintenance? Previous note on weak joint at Sta 4+66?

313023 on IH-80.

- Constructed 1984.
- Concern with AADT of about 10,000.
- Any planned maintenance?

Other SMP Items

Please give George Woolstrum the two SMP manuals and one video tape from the pilot installation. Note - some items in the video have been changed.

The attached notes from previous meeting agendas with the DOTs may help regarding requirements from the DOT for the program.

BRAUN℠
INTERTEC

Description: NEB. VIDEO REVIEW OF SMP

Project No: DBNX 92700 B6

Date: 11-JUL-95 By: RTU

3018 — Ron M. notes on video
7/19/95
- sta. 0700 better end for cabinet
- No distress
- PCC shoulder
- Joint/crack @ 5700

023 — Ron M notes
20/95)
- * Map cracking — light at this point — will be a problem?
- JT @ 0706
- ck. distress in adjacent lane @ 3475?
- JT @ 5701

OUT

— Concentrate on 313018

om: JUL 13 '95 11:50AM NEBR ROADS TEST LAB 402 479 3975 and time 07/13/95 P.21:02:08

DOR9007--NEBR ORTH, ELDON DOR11020--NEBR RONNAU, DALYCE
DOR5025--NEBR GUY, TERRY DOR34003--NEBR PARRISH, BILL
DOR9040--NEBR CHENEY, KEN

George Woolstrum

ject: Roadway Instrumentation

e FHWA-SHRP office is proposing to instrument the roadway at the SHRP
st site on I-80 east of Kearney. There will be a meeting:

ursday July 20,1995
00pm - 3:00pm
anning Division conference room
terials & Tests building

representative from the SHRP Regional Office will be here to discuss the
oject and various responsibilities.

Bob V. Copy

FHWA-LTPP SEASONAL MONITORING PROGRAM IN NEBRASKA

MEETING AGENDA

July 20, 1995 at 1:00 PM to 3:00 PM

Nebraska Department of Roads - Lincoln, Nebraska

Planning Division Conference Room - Materials and Tests Building

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Introductions – Signup sheet – NAME → DIVISION/DEPT. → PH. #

FHWA-LTPP Seasonal Monitoring Program in Nebraska

- Introduction
- Test Sections
- Sensor Description and Installation Procedures

Break

Planning Session for Agency Staff Involved with Instrumentation and Monitoring

- Installation and Monitoring Schedule
- Special Concerns
- Nebraska Department of Roads Responsibilities
- NCRCO and FHWA Staff Responsibilities
- Closing Comments

FHWA-LTPP Seasonal Monitoring Program in Nebraska

Introduction

Objectives of the Seasonal Monitoring Program

- Collect and analyze data on Ideal SHRP Sections to better understand the short and long term impacts of environmental factors including temperature, moisture, and frost/thaw depth on a pavement structure for improving pavement design.

- Factors defined in the core experiment monitored by FHWA-LTPP include
  - wet or dry climate
  - freeze or no freeze climate
  - pavement surface type (AC or PCC)
  - pavement surface thickness
  - original construction

- Agencies are encouraged to monitor supplemental sections to study factors not included in the core experiment
  - reduced monitoring requirements
  - use existing GPS or SPS sections

Overview of Sensor Installation and Monitoring Activities for Core experiment

- Two days for initial instrumentation installation and monitoring

- About $10,000 of equipment installed at each site

- Monitor sections every other year (70 days over a 10 year period)

- Relate environmental variations to changes in pavement performance
  - pavement, base and subgrade strength calculated from deflection data
    - collected monthly most of year and bi-weekly in the spring

  - ride quality determined from profile data
    - collected five times per year

  - pavement distress documented using detailed distress surveys
    - collected two times per year in addition to PASCO photo logging

  - frost heave/swelling soil monitored using elevation data
    - collected five times in the first year and two times per year after that

Test Sections

Section Location

- 64 sections in the Core Experiment for the United States and Canada monitored under FHWA-LTPP contract

- 16 sections in the North Central Region with two in Nebraska

  - 310114 (SPS-1), SB US-81, north of Chester (ST-8), Thayer County.
    - SMP Cell 11 - Dry, Freeze, Fine Subgrade, and Thick AC Pavement
    - 7.0 inch AC on 12.0 inch DGAB

  - 313018 (GPS-3), WB IH-80, east of Kearney, MP 274.57 to 274.48, Buffalo County.
    - SMP Cell 23 - Dry, Freeze, Coarse Subgrade, and JPC Pavement
    - 12.0 inch JPCP on 5.0 inch Soil Cement with 10 foot PCC shoulder.

- see map of core sections in the North Central Region on the next page

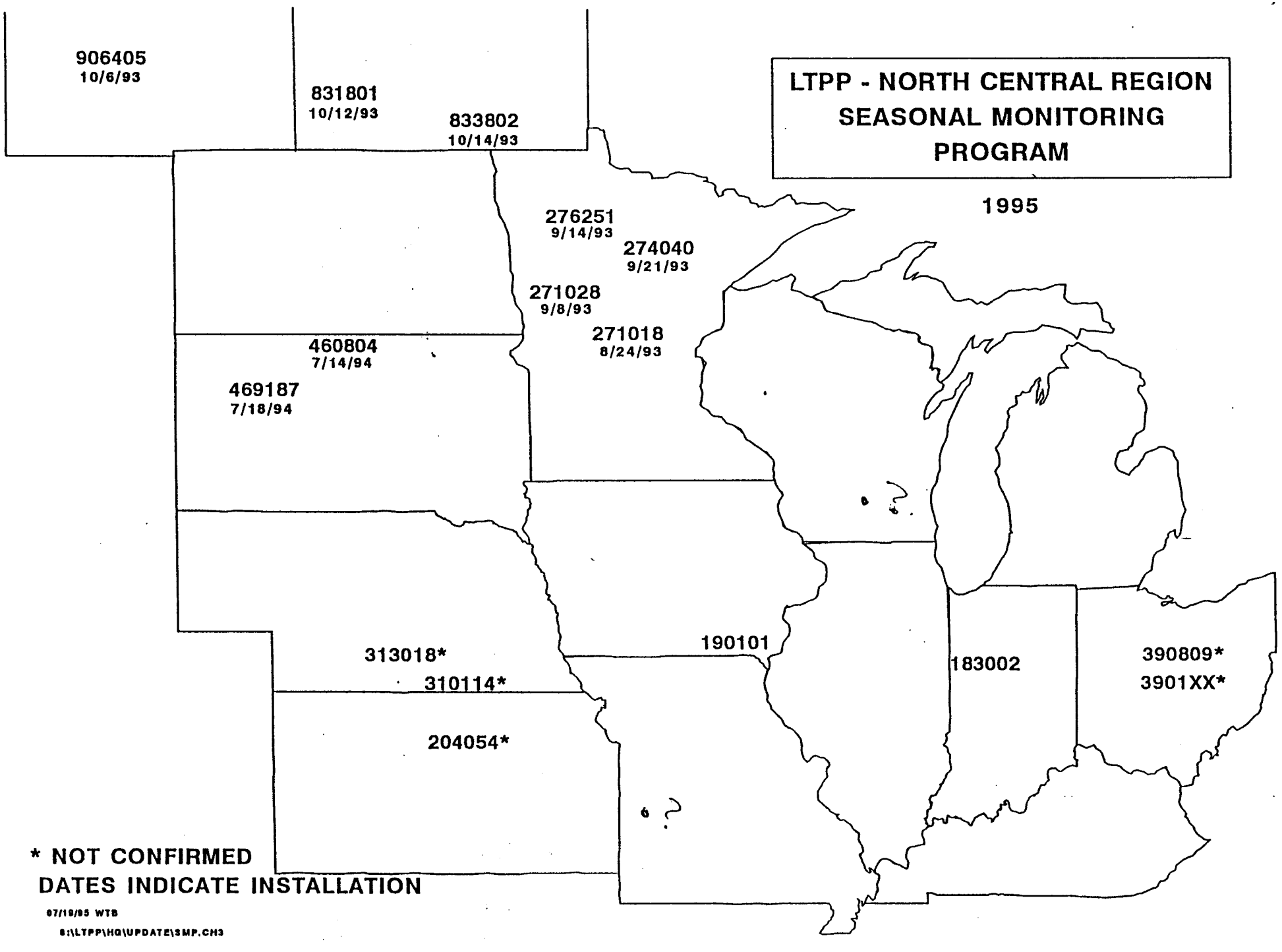
Allowable Maintenance

- any routine maintenance scheduled for either section?
  - shoulder work?

- no structural rehabilitation preferred for ten years → $$ invested - 3 loops to get data to analyze
  - safety is primary concern

- careful around buried cables and equipment
  - temperature probe one inch below pavement surface
  - piezometer cover two inches below the shoulder material
  - conduit one foot below surface from pavement edge to the cabinet

- careful plowing heavy snow and slush into the equipment cabinet


LTPP - NORTH CENTRAL REGION
SEASONAL MONITORING
PROGRAM
1995
906405
10/6/93
831801
10/12/93
833802
10/14/93
276251
9/14/93
274040
9/21/93
271028
9/8/93
271018
8/24/93
460804
7/14/94
469187
7/18/94
313018*
310114*
204054*
190101
183002
390809*
3901XX*
* NOT CONFIRMED
DATES INDICATE INSTALLATION
07/19/95 WTB
S:\LTPP\HQ\UPDATE\SMP.CH3

Sensor Description and Installation Procedure

TDR (Time Domain Reflectometry) Probes

- FHWA design available through Campbell Scientific @ $60.00 each (1993)

- measure dielectric of material between probes and relate to moisture content
  - material dielectrics - air = 1.0, dry soil = 3 to 4, and water = 80

- calibration
  - laboratory in air, water, and shorted
  - field moisture test on material placed around each probe
  - retain soil samples for additional laboratory calibration

- 10 probes per installation
  - one mid-depth in the base, seven at six inch intervals in the top of the subgrade, and two at 12 inch intervals approximately seven feet below the surface

Thermistor (Temperature) Probe

- Measurement Research Corporation (MRC) @ $1000.00 (1993)
  - built in multiplexer for automated readings on 18 channels

- thermistors change resistance with change in temperature

- stainless steel section (13 inches long) monitor pavement temperature gradient
  - one inch deep, mid depth, and one inch above bottom of pavement

- plexiglass section (72 inches long) monitor base and subgrade temperature gradient
  - 15 depths - three-inch intervals to 12 inch depth and six-inch intervals from 18 inch depth to 72 inch depth

- laboratory calibration (check) at 32°F and 100°F

Resistivity Instrumentation

- CRREL design probe @ $800.00 (1993)
  - PVC probe with 36 electrodes at two inch intervals

- large increase in resistance when moisture in the soil freezes
  - used to determine both frost and thaw depth

- require signal generator and multimeters for manual readings and CRREL multiplexer for automated readings

Air Temperature Probe

- Campbell Scientific @ $150.00 (1993)

- air probe and radiation shield mount on instrument pole nine feet above the ground

Rain Gauge/Tipping Bucket

- Texas Electronics @ $255.00 (1993)
- 0.1 mm (0.004 inches) liquid precipitation per tip
- mount on instrument pole nine feet above the ground

Equipment Cabinet and Instrument Pole

- telephone pedestal (break away classification)
  - contain power supply, data logger, sensor connections for mobile reader
  - conduit runs into cabinet from instrumentation hole
  - pea rock inside base to prevent condensation
  - located about 26 feet off edge of driving lane (limited by cable length)
- two-inch diameter instrument pole (break away classification)
  - extend below frost line
  - holds rain gauge and air temperature probe
  - located about 27 feet off edge of driving lane behind equipment cabinet

Interface/Communications Equipment

- FHWA "mobile" unit @ $5000.00 (1993)
  - used each site visit to automatically read TDR probes and resistivity probe
- Tektronics model 1502 cable reader @ $8000.00 (1993)
  - generates signal and monitors reflected energy from TDR probes
  - relate time for pulse to travel through probe to dielectric constant
    - relate dielectric constant to moisture content
- computer and software
  - "onsite" used to monitor temperatures and rainfall continuously
  - "mobile" used to monitor resistivity probe and TDR probes during site visits

Observation Piezometer

- monitor depth to ground water table
- designed to act as frost free bench mark with anchor at 14 foot depth
  - sliding section filled with grease extends eight feet below the surface

Measuring Points for Joint Movement on PCC Pavements

- install three sets of snap rings on each joint monitored
  - bonded 0.3 inched deep in the pavement at one, six and eleven feet from edge of slab
- measure distance between rings to the nearest 0.001 inch with digital caliper
  - use "hot" measurement as zero opening on the joint

Planning Session for Staff Involved with Instrumentation and Monitoring

Installation and Monitoring Schedule

Instrumentation Installation and Initial Monitoring

- two days required with third day as contingency
  - first day complete instrument installation
  - second day collect data

- tentative schedule
  - August 7 and 8 for 310114 on US-81
  - August 10 and 11 for 313018 on IH-80

Long Term Monitoring ~ start Sept ~

- one day every month with the exception of two times per month in the spring

- every other year for 10 years to obtain about 70 days of FWD monitoring data

period ; 5 yrs. of data

Special Concerns

Safety Issues

- bring up any safety concerns during installation

- buried utility markers and hazard markers for the cabinet and instrument pole?
  - standard "Buried Utility" marker for conduit?
  - hazard markers for snowmobiles? None Required

- any special agency requirements other than safety vests and work boots?

orange hats?

↑ where appropriate

B = 313013

Nebraska Department of Roads Responsibilities

315A —

Project Contacts for Maintenance Activities and Traffic Control
- will set up traffic control directly with district if desired

315B —

KEN

Utility Clearance
- 600 foot section (extend 50 foot outside both ends of 500 foot test section) 315A — Construction?
- utility clearance on driving lane and 40 feet into the ditch on the right side 315B —

Traffic Control
- two days for initial installation and monitoring in August 315A — Construction?
- full lane closure for 700 foot section on 313018 (310114 under construction) 315B — Aug. 10 + 11
- set up as early as possible - 7:30 AM?
- may want to mark locations for placing traffic control signs

OK

Establish Elevation Reference for Piezometer or Install Local Frost Free Bench Mark (DOT STD)
- actual elevation not required (local reference only)
- check piezometer elevation every other year? — to geodetic mark — 315A — anything as part of 315B

Equipment
- pavement saw and operator
  - only required for first day during instrument installation at each site
  - saw 16 inch square block out of the pavement surface (~~or option to core~~)
    - located in the outer wheel path
    - agency has option to epoxy block back in-place or patch hole
  - equipment capable of cutting one inch deeper than estimated pavement thicknesses
    - 310114 has 7.0 inches AC (cut 8.0 inches deep) — cut to deep.
    - 313018 has 12.0 inches PCC (cut 13.0 inches deep)
  - saw four inch wide trench for conduit on 313018
    - extend from outer wheel path to edge of 10 foot paved PCC shoulder
    - Note: 310114 has conduit installed under the pavement/shoulder
  - saw 13 inch slot for temperature probe

Saw

315A — Aug. 7
315B — Aug. 10

may modify on PCC to 16×38

↳ see if plant still operating

Rent larger one? — Bill.

— Horiz Boring. — George

3" ± D

- drill rig and operator
  - only required for first day during instrument installation at each site
  - able to reach location for instrument pole 27 feet off edge of driving lane
  - bore one six-inch diameter hole for piezometer
    - 14 feet deep
    - located just off paved shoulder
  - bore one 12-inch-diameter hole for instrumentation
    - eight feet deep in the outer wheel path
    - solid stem auger preferred
      - continuous flighting not required
      - NCRCO has 12-inch-diameter auger with 1-5/8 inch male hex drive

Hollow-stem

Bring → for — fork crowdoat for 12" ϕ to hold during break-down

- bore one 12-inch-diameter hole for equipment cabinet (or will dig by hand)
  - two feet deep
  - located about 26 feet outside the driving lane in the ditch

- bore one six-inch-diameter hole for the instrumentation pole
  - 10 feet deep
  - located one foot behind the equipment cabinet in the ditch

(Hollow stem) O.D. 7" to 8"

Need - ~~small~~ portable generator if readily available to run small power tools

Materials for Each Site

- cover assembly for piezometer (Braun Intertec can provide)
  - must function for ten years and be able to open in the winter
  - minimum four-inch inside diameter and 18 inches to 24 inches long

- sackcrete for piezometer cover and instrumentation pole
  - estimate six bags

- bentonite pellets for sealing piezometer
  - five-gallon pail

- clean filter sand for piezometer
  - 400 pounds (four bags)
  - particle size not critical (silica sand will work)

- pea gravel or trap rock for equipment cabinet
  - 500 pounds (four five-gallon pails)
  - 3/8 inch or 1/2 inch size preferred

- agency option to patch hole versus epoxy old block back in the pavement
  - additional materials required if patching
    - 310114 - hot mix patch or replace block?
    - 313018 - quick set patch or replace block?
    - ~~rebar and epoxy if patching?~~

Horiz Boring. will have quick set available 16x16x16

- patch for conduit trench (313018 only)
  - 10 foot long by four inch wide by ___ inch deep

- water for mixing sackcrete and equipment clean-up
  - estimate 30 gallons (available on drill rig?)

- ~~hazard markers for cabinet and instrument pole (if required by the agency)~~

Pavement Repairs

- ~~patch conduit trench (313018 only)~~
- assist with block replacement or patching

Miscellaneous Activities

- mow tall grass in area identified for utility clearance if needed

NCRCO (Braun Intertec) and FHWA Staff Responsibilities

Instrumentation

- provide all instrumentation
- install all instrumentation with assistance from anyone on-site
- collect all required monitoring data
- NCRCO phone 1-800-344-7477 or 612-942-3047
    - main contacts for the Seasonal Monitoring Program
        - Bob Van Sambeek (Coordination and instrumentation)
        - Ron Urbach (Geotechnical and materials)

Closing Comments

Questions or concerns?

NAME	DIVISION / DEPT.	TELEPHONE NO.
BOB VANSAMBEEK	BRAUN INTERTEC / LTPP	800-344-7477
* BILL PARRISH (Both Sites)	N.D.O.T. DIST. 4	308-385-6265
TERRY GUY	NDOR Planning	402-479-4509
Darrell L. Nave	NDOR Mat. & Tests	402-479-4707
George Woolstrum	NDOR M & T	402-479-4791
Ken Cheney (Drill Rig?)	NDOR M+T	402-479-4678
Dalyce Ronnau	Maint. Div	402-479-4544

TRAFFIC CONTROL CONTACTS

All ~~Hank~~ Horak	Chester (315A)	402-362-5930
William ~~Bobb~~ Bobb	Kearney (315B)	308-865-5930

→ will get # from Bill

- Fri. July 28 - George - possible to H-bore ahead?
  → better if not - allow FWD first, will ask FHWA if necessary
  → still no saw for 12" pcc - still calling around

Joe Voss? - Saw?

Don Missouri? - MST @ SPS-1 (310114 only)

BRAUN INTERTEC

Description: NE PIPE INSTALLATION MTG.

Project No: BBNX 92700 B6

Date: July 20, 95 By: BV

3B – Expect piez. to cave (H2O down 3' to 4') – 3¼" I.D. Hollow stem auger – PVC piez. – No base plate on PVC Piez. – Require DOT BM

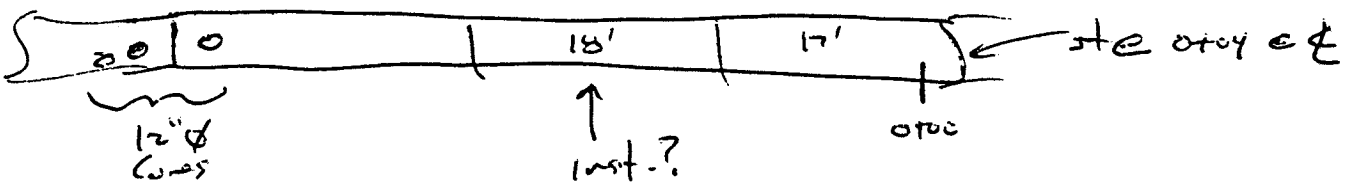
– DOT will look into H-bape vs. cut shoulder for 315B

E VISIT 315B (Some day as meeting)

Just before Kearney exit – Hwy. 10 has TSC, food, motels

delineators @ 2' off pcc shoulder (12' off lane w/ 10' shoulder)

k 0100 – maybe to skip panel or test 1½ outside section
– No concern w/ trees
– less concern w/ mower clearing cabinet & delineator



ft. 5100 – small trees 50' N. of edge of driving lane should not influence the site

– small panel @ 5106 ~13'
– work well w/ ST @ 4+99.5

– Est. 14' ~~between~~ wide mower –
10' shoulder + 14' mower = 24' w/ cabinets
26' then okay.

FACSIMILE MEMORANDUM

Braun Intertec Corporation
6875 Washington Avenue South, P.O. Box 39108, Minneapolis, MN 55439-0108
(612) 941-5600 FAX: (612) 942-3059

TO: Gonzalo Rada - 301-210-5032
Gary Elkins - 702-827-0137
Aramis Lopez - 703-285-2767

Pages 6

FROM: Robert J. Van Sambeek (612) 942-3047

DATE: August 2, 1995

SUBJECT: SMP Site 311018 (31SB) Concerns with "Soil Cement" and Monitoring Location
C:\SMP\WP\31SBINST.SMP

"Soil Cement" Concerns

Below is a description of what I predict will happen at the installation. Also see attached sketch.

* The DOT will be installing a conduit using a horizontal boring machine (not allow the tied PCC shoulder to be cut). I anticipate the conduit will come in below the soil cement base.

* Saw PCC surface +12" depth and try to break block loose from the soil cement base. The block will be replaced if not damaged. If the block is damaged (have to jack-hammer out) during removal, the hole will be patched with quick-set concrete.

* Auger 12" diameter hole through the soil cement base (5.6" thick) using slow penetration of the auger to grind the material to a consistent size (0.5" and minus?). This material will be retained for replacement if FHWA and the TAC agree to mixing it with additional cement (mortar mix) and sufficient water for compaction requirements. Otherwise, the hole will be patched with mortar mix or quick-set concrete patch.
  - Which alternative retains the most similar thermal properties?
  - Will both alternatives provide a repair with the same characteristics for heave, etc.?

* Auger subgrade to a depth required for placing MRC and resistivity probes 2.0 inches below the soil cement (top of probes 19.5" below the pavement surface). Assuming two probes not placed in soil cement (bound material).

* Place TDR#10 89.5" below PCC surface, which corresponds to TDR#1 at 6.0" below the base. Other alternative is to place TDR#1 mid-depth in the soil cement base, which would put TDR#10 81 inches below the pavement surface. Which alternative to use? Will this depend on the condition of the soil cement after augering, and data sheet SMP-102 should be prepared for both situations, and field judgement will determine the alternative to use?

* Make slot in soil cement for lead from metal part of MRC (drill 0.5" diameter hole?).

Moved to Appendix A-2 for the installation report

Monitoring End

Pre-SMP installation FWD done this spring had limited hours for traffic control and six panels on each end of the section were tested to evaluate which end of the section to monitor. Please review the attached FWDCHECK data in addition to the comments below regarding which end to monitor.

Sta. 0 - Concern with which panels to monitor

- Joint is at Sta. 0+04 and my first choice would be to monitor almost 1.75 panels outside the section limit to avoid having to skip a panel while not instrumenting in a panel partially into the section. Instrumentation would be in a 18 foot panel. See sketch on FWDCHECK sheets.

- No trees to influence wind pattern.

- Distance between cabinet location and marker posts not hinder 14 foot mower.

Sta. 5 - Trees about 50 feet from the edge of the road may influence the wind patterns at the section. The trees are north of the road and will not shade the section.

- The last joint in the section cuts across the Sta. 5+00 line, and the next panel is 13 feet long (small panel of random size panels). This panel would be instrumented.

- Risk damage to cabinet from mower going between the cabinet and posts marking the section (posts are two foot off the paved shoulder and do not expect they can be moved).

- Poor load transfer at Sta. 4+68 noted on previous FWD testing, but it is not significantly different in the pre-installation FWD testing.

okay At this point I favor the Sta. 0 end with 1.75 panels ~~can be~~ monitored outside the section to avoid skipping a panel (random space panels - want to test a "set" of panels?). ~~Otherwise, no panels would have to be skipped at Sta. 5 end~~.

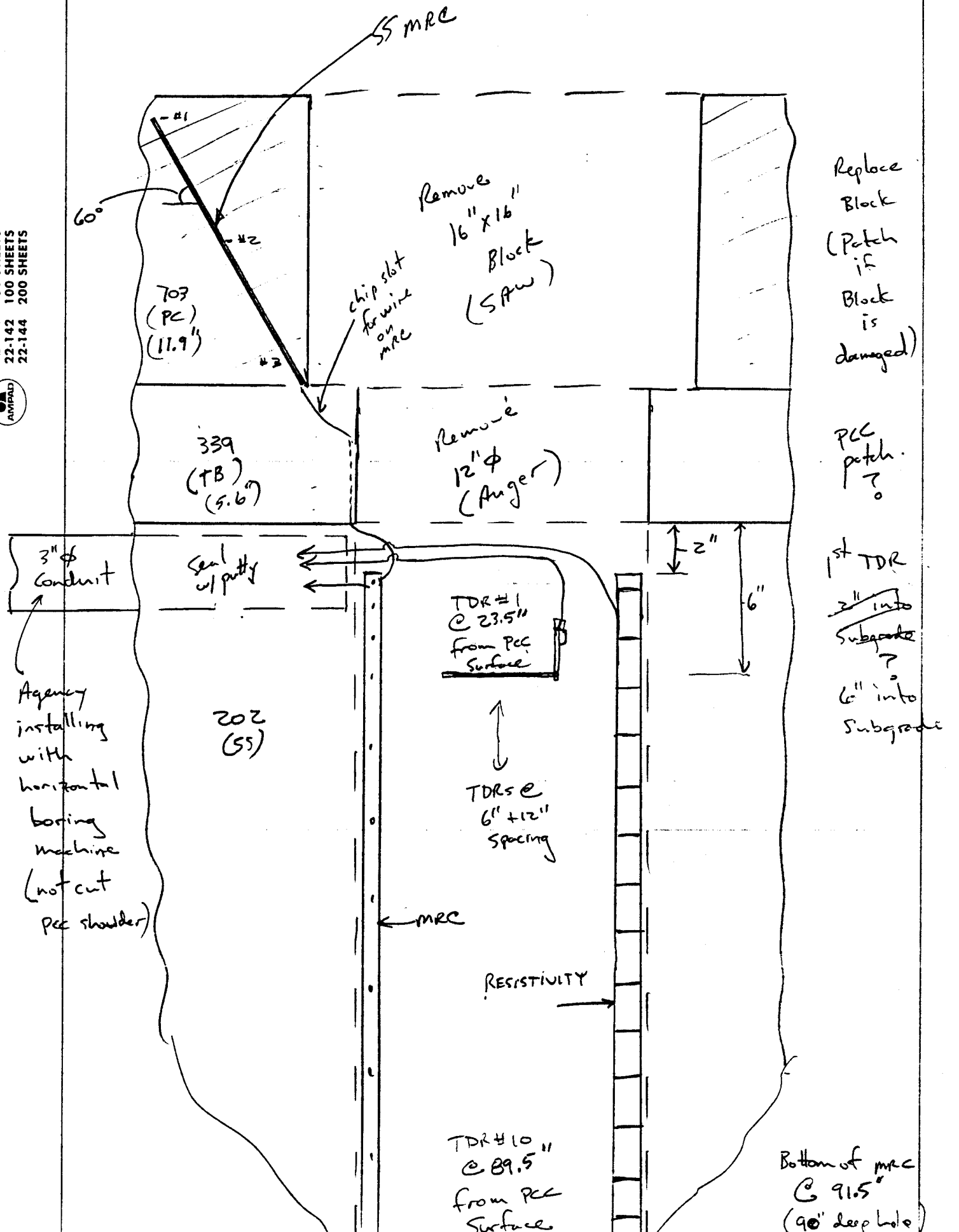
okay Regarding the MRC and resistivity probe, I will plan on placing the probes 2.0" below the base layer unless instructed otherwise.

okay Regarding the TDRs, I will plan on placing TDR#1 6.0" below the base layer unless instructed otherwise.

~~The installation is scheduled for Thursday, August 10. However, the SMP crew will be traveling on August 6 and installing another section on August 7 and 8. If possible please get back to me by Friday August 4 regarding:~~

(1) the section end to monitor, — Sta. 0 end. —
(2) specifics on MRC and resistivity probe placement, and ←
(3) specifics on TDR#1 placement. ← 6" below Base.

02-Aug-1995 | DBNX92700 BG | 313018 - SENSORS



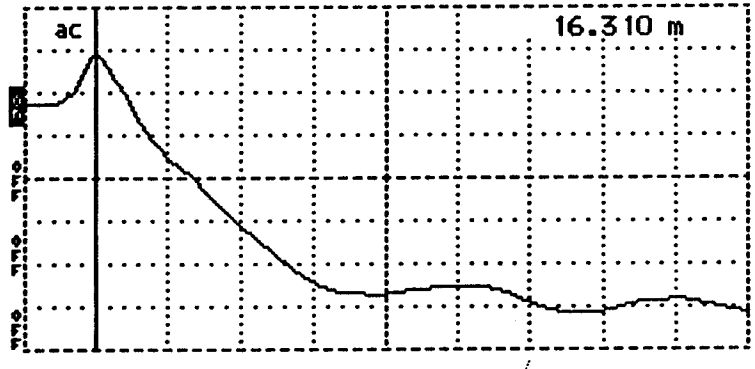
Appendix B-2: Pre-Installation Equipment Checks/Calibration Information

Appendix B-2 contains the following data sheets for the pre-installation equipment checks/calibration:

- Data Sheet SMP-C01: TDR Probe Check;
- Data Sheet SMP-C02: Thermistor and Air Temperature Probe Check;
- Data Sheet SMP-C03: Electrical Resistivity Probe Check;
- Data Sheet SMP-C04: Function Generator, Multi-meter, and Switch Box Checks; and
- Data Sheet SMP-C05: Tipping-Bucket Rain Gauge Calibration.

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 1) TDR Probe Check	Agency Code [31] LTPP Section ID [3018]

Cursor ..... 16.310 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac

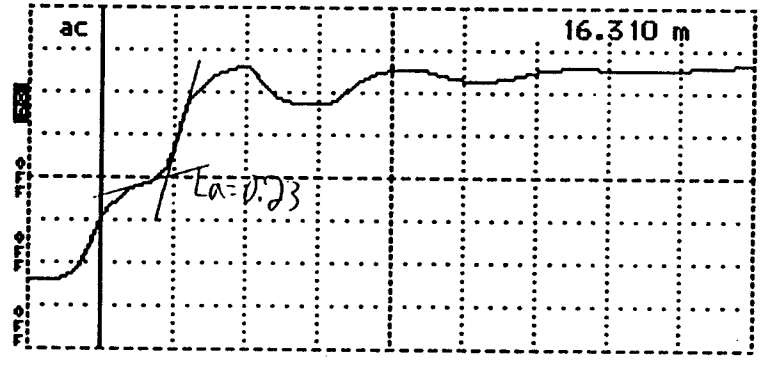


Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B01
Notes short

Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[1]
"Shorted at Start"		

Cursor ..... 16.310 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



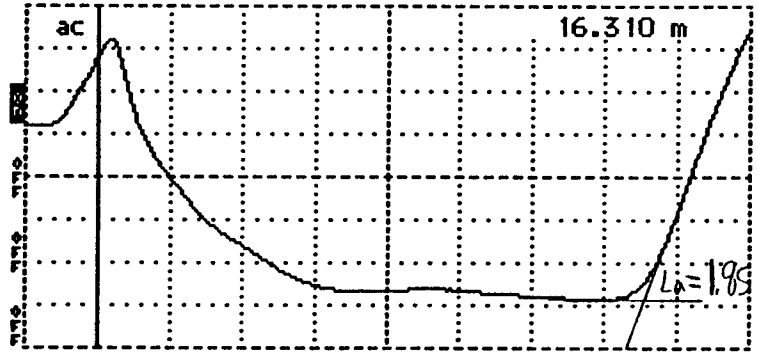
Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B01
Notes air

Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[1]
"In Air"	0.23	1.30

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 2) TDR Probe Check	Agency Code [31] LTPP Section ID [30181]

Cursor ..... 16.310 m
Distance/Div..... .25 m/div
Vertical Scale.... 74.8 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B01
Notes water @ room temp.

Input Trace _____
Stored Trace .....
Difference Trace .....

TDR Trace	Apparent Length, (m)	Dielectric Constant[2]
"In Water"	1.95	83.91

[1] If dielectric constant not between 0.75 and 2.0, contact FHWA LTPP Division
[2] If dielectric constant not between 76 and 84, contact FHWA LTPP Division

Note: Dielectric constant is determined as follows:

$$\varepsilon = \left[\frac{(L_a)}{(L)(V_p)}\right]^2 = \left[\frac{(D_2 - D_1)}{(L)(V_p)}\right]^2$$

where ε = dielectric constant; L_a = apparent length of probe, m; L = actual length of probe units (= 0.203 m (8 in) for FHWA probes); V_p = phase velocity setting (= 0.99).

TDR Probe Serial Number: 31B01 TS01 TDR Probe Length, L: 0.204 m Length of Coax Cable: ___.__ m

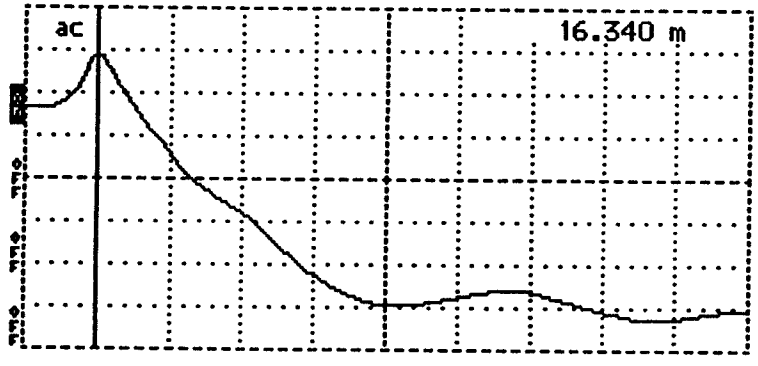
Comments: _____

Prepared by: Jeff Herrickson Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 14/JUL/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 1) TDR Probe Check	Agency Code [31] LTPP Section ID [30 18]

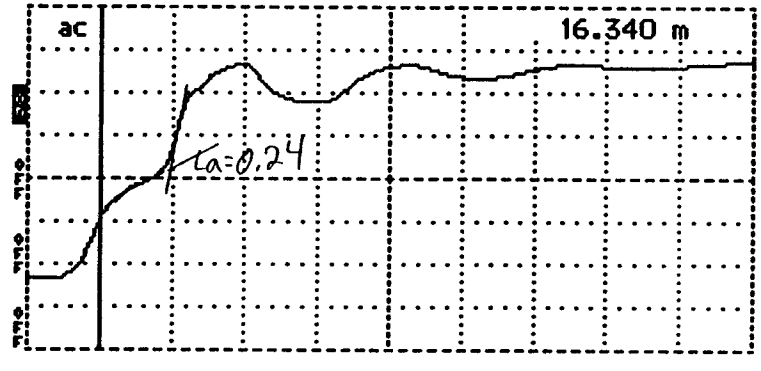
Cursor ..... 16.340 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 02
Notes shat
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant
"Shorted at Start"		

Cursor ..... 16.340 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac

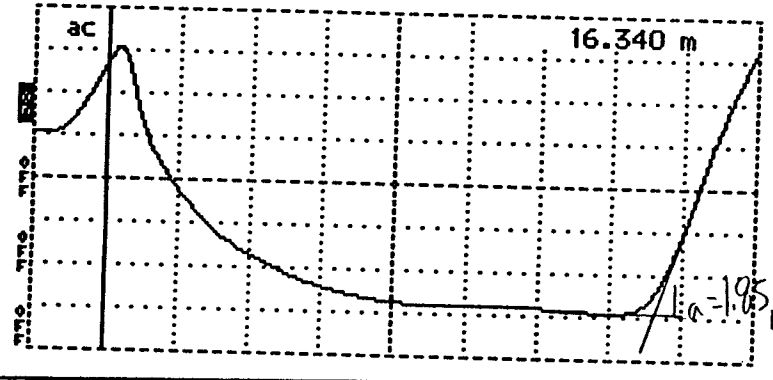


Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 02
Notes air
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[1]
"In Air"	0.24	1.41

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 2) TDR Probe Check	Agency Code [37] LTPP Section ID [30 18]

Cursor ..... 16.340 m
Distance/Div..... .25 m/div
Vertical Scale.... 74.8 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B02
Notes water @ room temp.

Input Trace _____
Stored Trace _____
Difference Trace _____

TDR Trace	Apparent Length, (m)	Dielectric Constant[2]
"In Water"	1.85	83.91

[1] If dielectric constant not between 0.75 and 2.0, contact FHWA LTPP Division
[2] If dielectric constant not between 76 and 84, contact FHWA LTPP Division

Note: Dielectric constant is determined as follows:

$$\varepsilon = \left[\frac{(L_a)}{(L)(V_p)}\right]^2 = \left[\frac{(D_2 - D_1)}{(L)(V_p)}\right]^2$$

where ε = dielectric constant; L_a = apparent length of probe, m; L = actual length of probe units (= 0.203 m (8 in) for FHWA probes); V_p = phase velocity setting (= 0.99).

TDR Probe Serial Number: 31B02 TDR Probe Length, L: 0.204 m Length of Coax Cable: ___.__ m

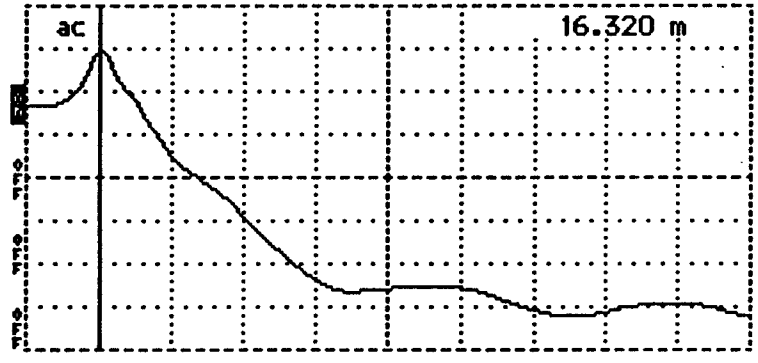
Comments: _____

Prepared by: Jeff Henrickson Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 14/JUL/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 1) TDR Probe Check	Agency Code [3 1] LTPP Section ID [3 0 1 8]

Cursor ..... 16.320 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac

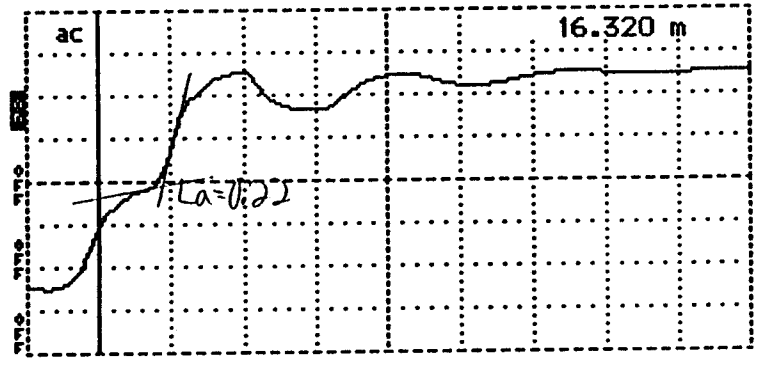


Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 03
Notes short

Input Trace _____
Stored Trace _____
Difference Trace _____

TDR Trace	Apparent Length, (m)	Dielectric Constant
"Shorted at Start"	_____	_____

Cursor ..... 16.320 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



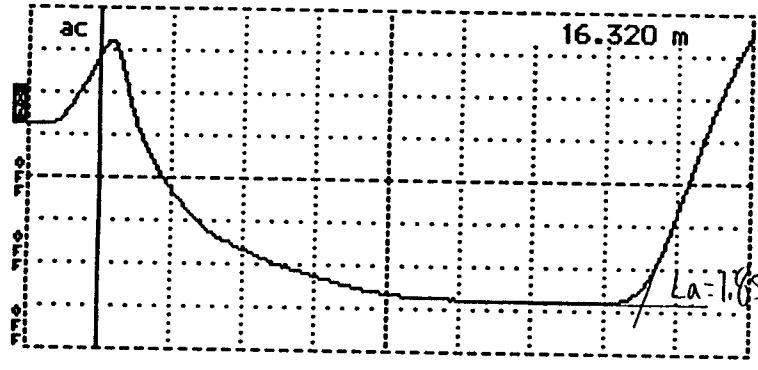
Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 03
Notes air

Input Trace _____
Stored Trace _____
Difference Trace _____

TDR Trace	Apparent Length, (m)	Dielectric Constant[1]
"In Air"	0.22	1.19

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 2) TDR Probe Check	Agency Code [31] LTPP Section ID [3018]

Cursor ..... 16.320 m
Distance/Div..... .25 m/div
Vertical Scale.... 74.8 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 03
Notes water @ room temp.
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[2]
"In Water"	1.95	83.91

[1] If dielectric constant not between 0.75 and 2.0, contact FHWA LTPP Division
[2] If dielectric constant not between 76 and 84, contact FHWA LTPP Division

Note: Dielectric constant is determined as follows:

$$\varepsilon = \left[\frac{(L_a)}{(L)(V_p)}\right]^2 = \left[\frac{(D_2 - D_1)}{(L)(V_p)}\right]^2$$

where ε = dielectric constant; L_a = apparent length of probe, m; L = actual length of probe units (= 0.203 m (8 in) for FHWA probes); V_p = phase velocity setting (= 0.99).

TDR Probe Serial Number: 31B03 TDR Probe Length, L: 0.204 m Length of Coax Cable: ___.__ m

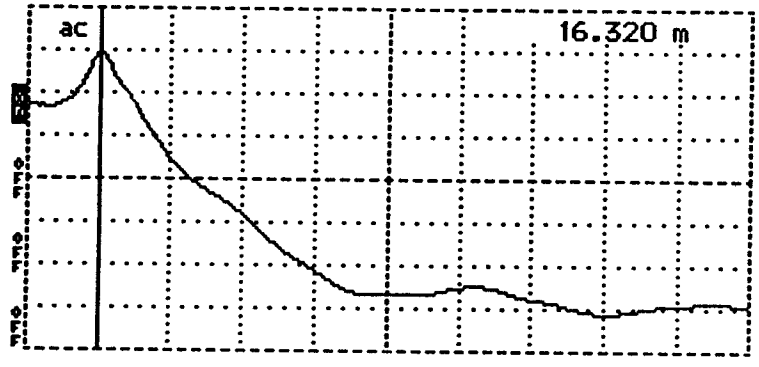
Comments: _____

Prepared by: Jeff Henrichson Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 14/JUL/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 1) TDR Probe Check	Agency Code [37] LTPP Section ID [3018]

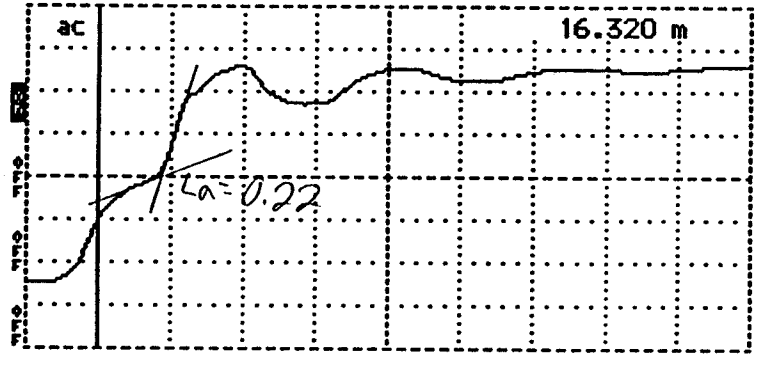
Cursor ..... 16.320 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 3/8 04
Notes short
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant
"Shorted at Start"		

Cursor ..... 16.320 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac

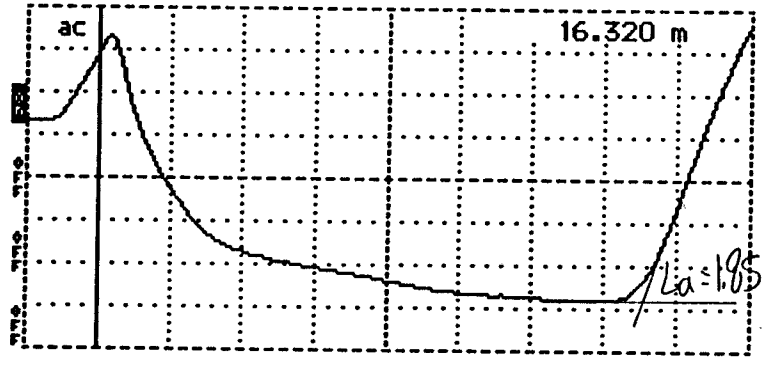


Tektronix 1502B TDR
Date 14-JUL-95
Cable 04
Notes air
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[1]
"In Air"	0.22	1.19

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 2) TDR Probe Check	Agency Code [37] LTPP Section ID [3018]

Cursor ..... 16.320 m
Distance/Div..... .25 m/div
Vertical Scale.... 74.8 mρ/div
VP 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 04
Notes water @ room temp.
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[2]
"In Water"	1.85	83.21

[1] If dielectric constant not between 0.75 and 2.0, contact FHWA LTPP Division
[2] If dielectric constant not between 76 and 84, contact FHWA LTPP Division

Note: Dielectric constant is determined as follows:

$$\varepsilon = \left[\frac{(L_a)}{(L)(V_p)}\right]^2 = \left[\frac{(D_2 - D_1)}{(L)(V_p)}\right]^2$$

where ε = dielectric constant; L_a = apparent length of probe, m; L = actual length of probe units (= 0.203 m (8 in) for FHWA probes); V_p = phase velocity setting (= 0.99).

TDR Probe Serial Number: 31B04 TDR Probe Length, L: 0.204 m Length of Coax Cable: ___.__ m

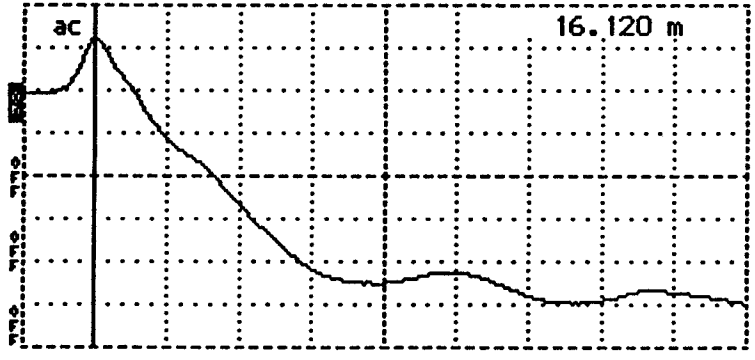
Comments: _____

Prepared by: Jeff Henrichson Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 14/JUL/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 1) TDR Probe Check	Agency Code [31] LTPP Section ID [3018]

Cursor ..... 16.120 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac

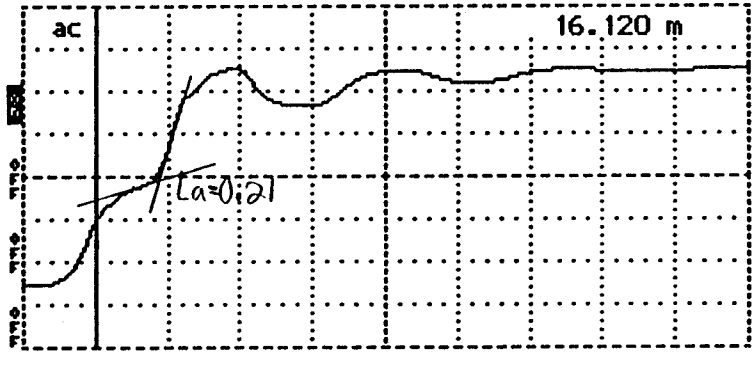


Tektronix 1502B TDR
Date 14-JUL-95
Cable 3IB05
Notes short

Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant
"Shorted at Start"		

Cursor ..... 16.120 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



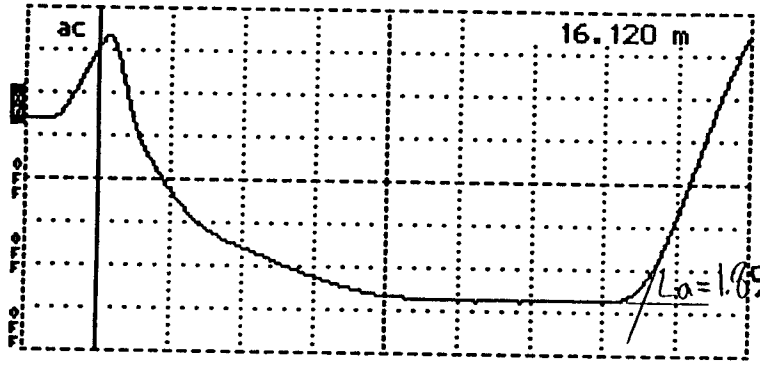
Tektronix 1502B TDR
Date 14-JUL-95
Cable 3IB05
Notes air

Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[1]
"In Air"	0.21	1.08

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 2) TDR Probe Check	Agency Code [31] LTPP Section ID [3018]

Cursor ..... 16.120 m
Distance/Div..... .25 m/div
Vertical Scale.... 74.8 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B05
Notes water @ room temp.
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[2]
"In Water"	1.85	83.91

[1] If dielectric constant not between 0.75 and 2.0, contact FHWA LTPP Division
[2] If dielectric constant not between 76 and 84, contact FHWA LTPP Division

Note: Dielectric constant is determined as follows:

$$\varepsilon = \left[\frac{(L_a)}{(L)(V_p)}\right]^2 = \left[\frac{(D_2 - D_1)}{(L)(V_p)}\right]^2$$

where ε = dielectric constant; L_a = apparent length of probe, m; L = actual length of probe units (= 0.203 m (8 in) for FHWA probes); V_p = phase velocity setting (= 0.99).

TDR Probe Serial Number: 31B05 TDR Probe Length, L: 0.204 m Length of Coax Cable: ___.__ m

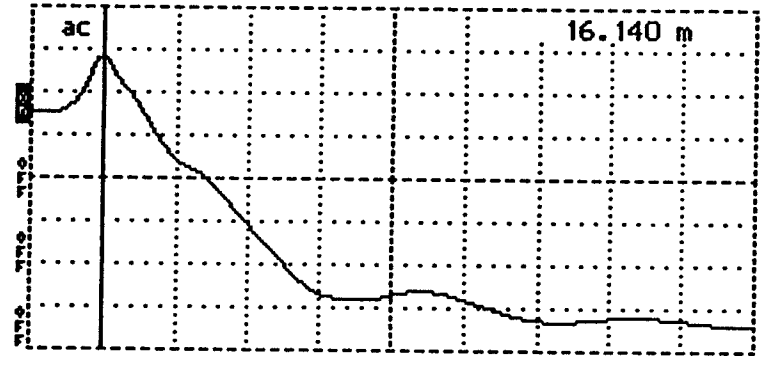
Comments: _____

Prepared by: Jeff Henrichson Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 14/JUL/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 1) TDR Probe Check	Agency Code [37] LTPP Section ID [30 18]

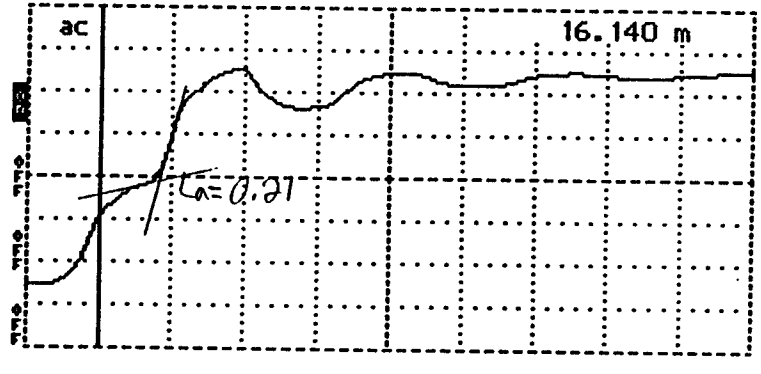
Cursor ..... 16.140 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 3105 06
Notes short
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant
"Shorted at Start"		

Cursor ..... 16.140 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac

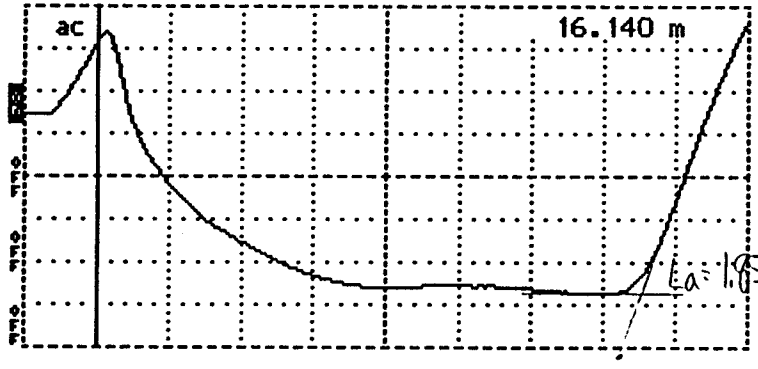


Tektronix 1502B TDR
Date 14-JUL-95
Cable 06
Notes air
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[1]
"In Air"	0.21	1.08

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 2) TDR Probe Check	Agency Code [31] LTPP Section ID [3018]

Cursor ..... 16.140 m
Distance/Div..... .25 m/div
Vertical Scale.... 74.8 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 06
Notes water @ room temp.

Input Trace _____
Stored Trace _____
Difference Trace _____

TDR Trace	Apparent Length, (m)	Dielectric Constant[2]
"In Water"	1.95	83.91

[1] If dielectric constant not between 0.75 and 2.0, contact FHWA LTPP Division
[2] If dielectric constant not between 76 and 84, contact FHWA LTPP Division

Note: Dielectric constant is determined as follows:

$$\varepsilon = \left[\frac{(L_a)}{(L)(V_p)}\right]^2 = \left[\frac{(D_2 - D_1)}{(L)(V_p)}\right]^2$$

where ε = dielectric constant; L_a = apparent length of probe, m; L = actual length of probe units (= 0.203 m (8 in) for FHWA probes); V_p = phase velocity setting (= 0.99).

TDR Probe Serial Number: 31B06 TDR Probe Length, L: 0.204 m Length of Coax Cable: __.__ m

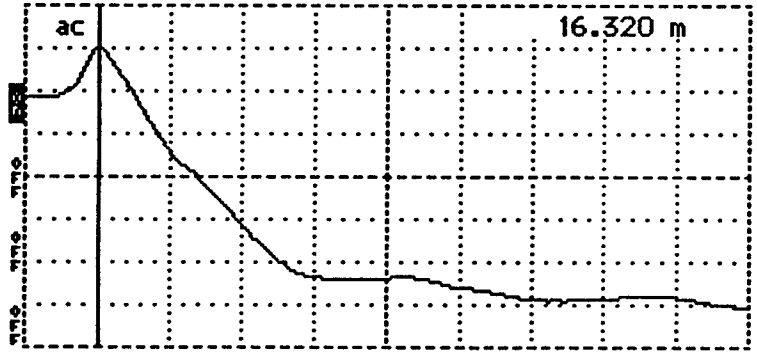
Comments: _____

Prepared by: Jeff Herrichsa Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 14/JUL/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 1) TDR Probe Check	Agency Code [37] LTPP Section ID [3018]

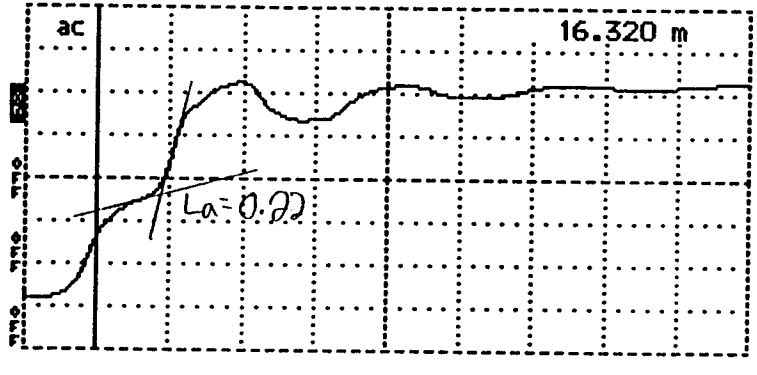
Cursor ..... 16.320 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 316 07
Notes short
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant
"Shorted at Start"		

Cursor ..... 16.320 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac

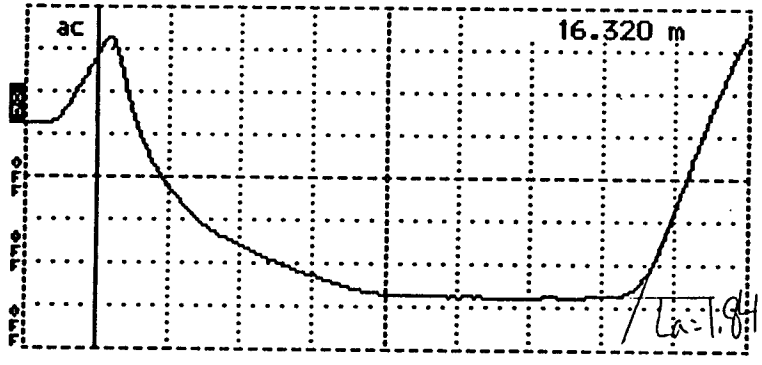


Tektronix 1502B TDR
Date 14-JUL-95
Cable 07
Notes air
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[1]
"In Air"	0.22	1.19

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 2) TDR Probe Check	Agency Code [31] LTPP Section ID [3018]

Cursor ..... 16.320 m
Distance/Div..... .25 m/div
Vertical Scale.... 74.8 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 19-JUL-95
Cable 31B07
Notes water @ room temp.
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[2]
"In Water"	1.84	83.00

[1] If dielectric constant not between 0.75 and 2.0, contact FHWA LTPP Division
[2] If dielectric constant not between 76 and 84, contact FHWA LTPP Division

Note: Dielectric constant is determined as follows:

$$\varepsilon = \left[\frac{(L_a)}{(L)(V_p)}\right]^2 = \left[\frac{(D_2 - D_1)}{(L)(V_p)}\right]^2$$

where ε = dielectric constant; L_a = apparent length of probe, m; L = actual length of probe units (= 0.203 m (8 in) for FHWA probes); V_p = phase velocity setting (= 0.99).

TDR Probe Serial Number: 31B07 TDR Probe Length, L: 0.204 m Length of Coax Cable: ___.__ m

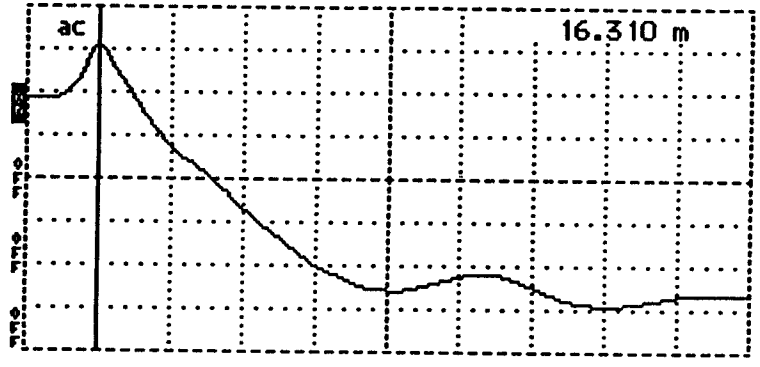
Comments: _____

Prepared by: Jeff Hendrickson Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 14/JUL/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 1) TDR Probe Check	Agency Code [31] LTPP Section ID [3018]

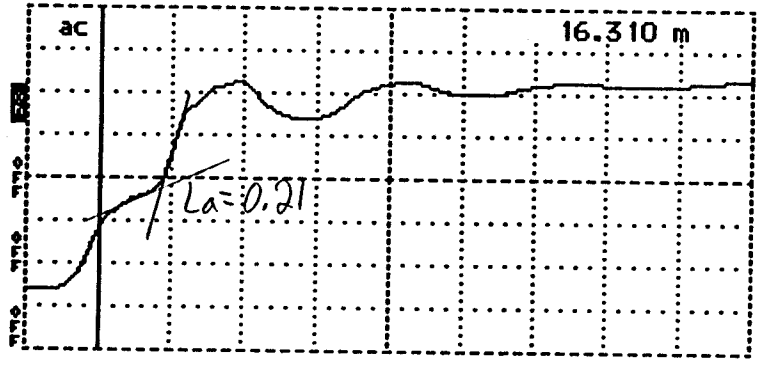
Cursor ..... 16.310 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
VP 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 09
Notes Short
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant
"Shorted at Start"	—	—

Cursor ..... 16.310 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
VP 0.99
Noise Filter..... 1 avg
Power..... ac

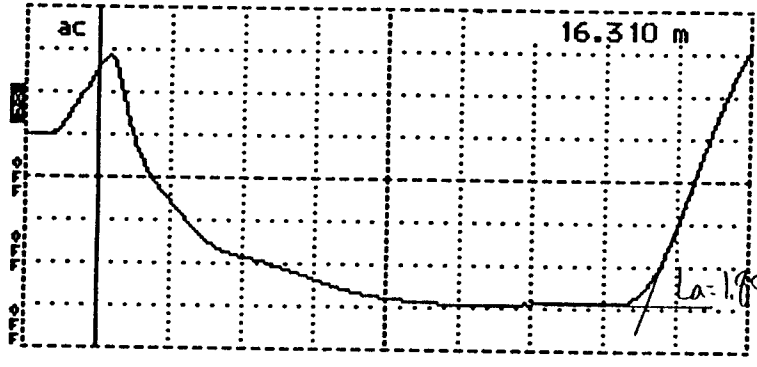


Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 08
Notes air
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[1]
"In Air"	0.21	1.08

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 2) TDR Probe Check	Agency Code [37] LTPP Section ID [3018]

Cursor ..... 16.310 m
Distance/Div..... .25 m/div
Vertical Scale.... 74.8 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B08
Notes water @ room temp.

Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[2]
"In Water"	1.95	93.91

[1] If dielectric constant not between 0.75 and 2.0, contact FHWA LTPP Division
[2] If dielectric constant not between 76 and 84, contact FHWA LTPP Division

Note: Dielectric constant is determined as follows:

$$\varepsilon = \left[\frac{(L_a)}{(L)(V_p)}\right]^2 = \left[\frac{(D_2 - D_1)}{(L)(V_p)}\right]^2$$

where ε = dielectric constant; L_a = apparent length of probe, m; L = actual length of probe units (= 0.203 m (8 in) for FHWA probes); V_p = phase velocity setting (= 0.99).

TDR Probe Serial Number: 31B08 TDR Probe Length, L: 0.204 m Length of Coax Cable: ___.__ m

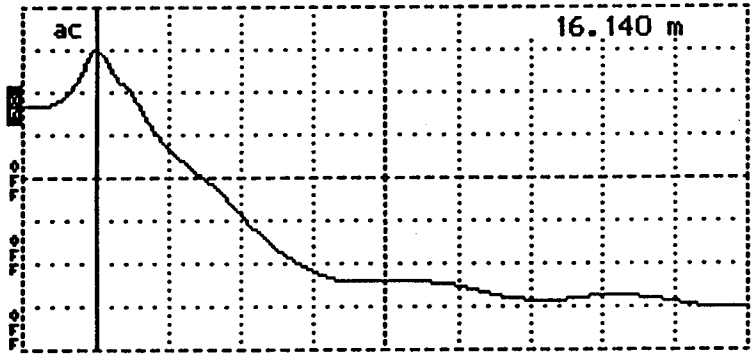
Comments: _____

Prepared by: Jeff Henrichson Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 14/JUL/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 1) TDR Probe Check	Agency Code [31] LTPP Section ID [3018]

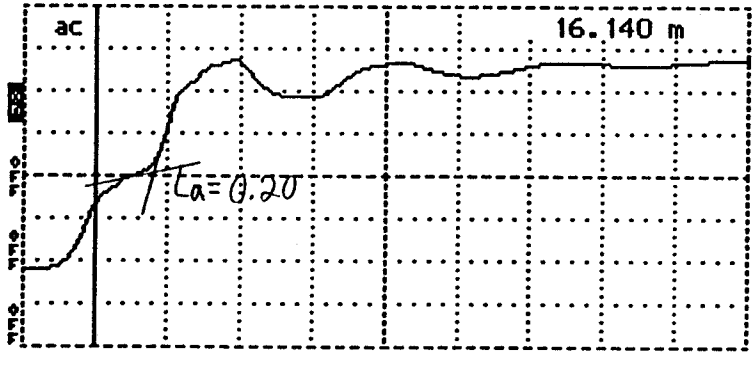
Cursor ..... 16.140 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 09
Notes short
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant
"Shorted at Start"		

Cursor ..... 16.140 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac

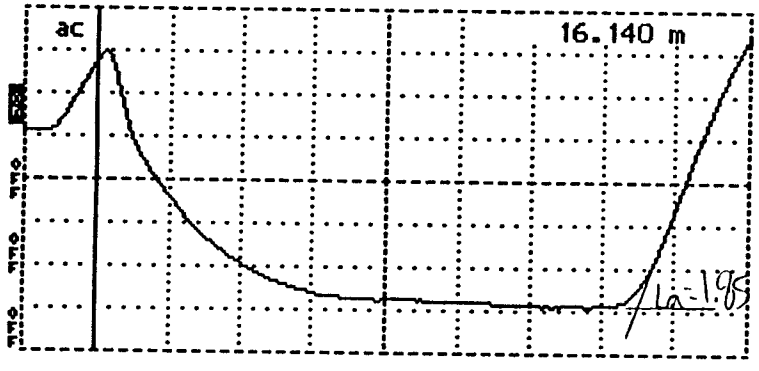


Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 09
Notes air
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[1]
"In Air"	0.20	0.98

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 2) TDR Probe Check	Agency Code [31] LTPP Section ID [3018]

Cursor ..... 16.140 m
Distance/Div..... .25 m/div
Vertical Scale.... 74.8 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31809
Notes water @ room temp.

Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[2]
"In Water"	1.85	83.91

[1] If dielectric constant not between 0.75 and 2.0, contact FHWA LTPP Division
[2] If dielectric constant not between 76 and 84, contact FHWA LTPP Division

Note: Dielectric constant is determined as follows:

$$\varepsilon = \left[\frac{(L_a)}{(L)(V_p)}\right]^2 = \left[\frac{(D_2 - D_1)}{(L)(V_p)}\right]^2$$

where ε = dielectric constant; L_a = apparent length of probe, m; L = actual length of probe units (= 0.203 m (8 in) for FHWA probes); V_p = phase velocity setting (= 0.99).

TDR Probe Serial Number: 31809 TDR Probe Length, L: 0.204 m Length of Coax Cable: ___.__ m

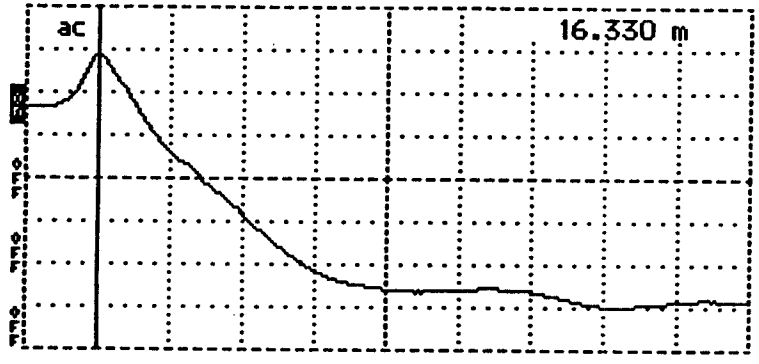
Comments: _____

Prepared by: Jeff Havichson Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 14/JUL/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 1) TDR Probe Check	Agency Code [37] LTPP Section ID [3018]

Cursor ..... 16.330 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac

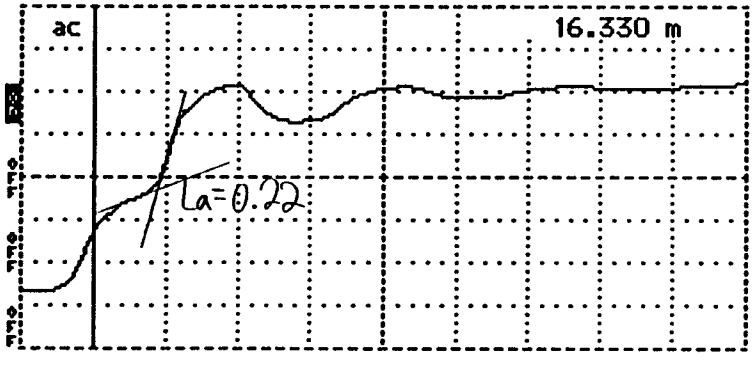


Tektronix 1502B TDR
Date 14-JUL-95
Cable 3LK 10
Notes short

Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant
"Shorted at Start"		

Cursor ..... 16.330 m
Distance/Div..... .25 m/div
Vertical Scale.... 177 mρ/div
Vp 0.99
Noise Filter..... 1 avg
Power..... ac



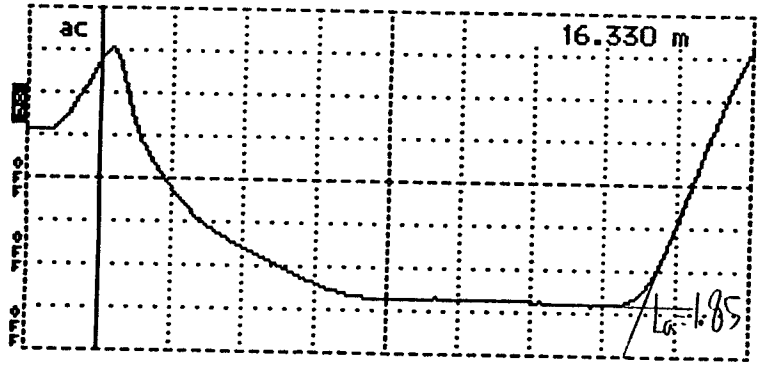
Tektronix 1502B TDR
Date 14-JUL-95
Cable 3LK 10
Notes air

Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[1]
"In Air"	0.22	1.19

LTPP Seasonal Monitoring Program Data Sheet SMP-C01 (Page 2) TDR Probe Check	Agency Code [31] LTPP Section ID [3018]

Cursor ..... 16.330 m
Distance/Div..... .25 m/div
Vertical Scale.... 74.8 mρ/div
VP 0.99
Noise Filter..... 1 avg
Power..... ac



Tektronix 1502B TDR
Date 14-JUL-95
Cable 31B 10
Notes water @ room temp
Input Trace
Stored Trace
Difference Trace

TDR Trace	Apparent Length, (m)	Dielectric Constant[2]
"In Water"	1.85	83.91

[1] If dielectric constant not between 0.75 and 2.0, contact FHWA LTPP Division
[2] If dielectric constant not between 76 and 84, contact FHWA LTPP Division

Note: Dielectric constant is determined as follows:

$$\varepsilon = \left[\frac{(L_a)}{(L)(V_p)}\right]^2 = \left[\frac{(D_2 - D_1)}{(L)(V_p)}\right]^2$$

where ε = dielectric constant; L_a = apparent length of probe, m; L = actual length of probe units (= 0.203 m (8 in) for FHWA probes); V_p = phase velocity setting (= 0.99).

TDR Probe Serial Number: 31B10 TDR Probe Length, L: 0.204 m Length of Coax Cable: ___.__ m

Comments: _____

Prepared by: Jeff Henrickson Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 14/JUL/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C02 Thermistor Probe Check	Agency Code [31] LTPP Section ID [3018]

Thermistor Probe Assigned Serial Number : [31B T]

Air Temperature Probe Assigned Serial Number: [31B A T]

Thermistor Number	Distance from Top (m)	Temperature (°C) – Calibration in: Ice-Bath; T = 1.7°C	Other HOT; T = 38.9°C	Comments
1	~~.~~	1.66	38.3	
2	~~.~~	1.66	38.3	
3	~~.~~	1.59	38.4	
4	0.019	1.49	38.3	
5	0.094	1.66	38.4	
6	0.171	1.74	38.4	
7	0.248	1.81	38.2	
8	0.325	1.81	38.2	
9	0.480	1.74	38.2	
10	0.627	1.70	38.1	
11	0.781	1.77	38.0	
12	0.932	1.84	38.3	
13	1.086	1.81	38.3	
14	1.238	1.74	38.0	
15	1.389	1.91	38.0	
16	1.540	1.91	38.3	
17	1.695	1.91	38.3	
18	1.846	1.84	38.2	
End	1.854	n/a	n/a	
Air Probe	n/a	1.11	38.8	

Comments: Probes in environmental chamber

COLD CYCLE: 3 Aug 95 TIME = 1254, DISPLAY TEMP = 1.17°C, HG TEMP = 1.67°C

HOT CYCLE: 2 Aug 95 TIME = 1435, DISLAY TEMP = 38.0°C, HG TEMP = 38.9°C

Prepared by: Jeff Henrichson Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 12/JUL/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C03 Resistivity Probe Check	Agency Code [31] LTPP Section ID [3018]

Electrical Resistivity Serial Number: 31BR

DB37 Connector Pin Number	Electrode Number	Distance from Top (m) (round up)			Continuity ✓	Spacing (m)	Comments
		Line 1	Line 2	Avg			
36	1	0.029	.030	.030	✓	———	
35	2	0.078	.079	.079	✓	.049	
34	3	0.130	.130	.130	✓	.051	
33	4	0.181	.181	.181	✓	.052	
32	5	0.232	.233	.233	✓	.052	
31	6	0.281	.283	.282	✓	.049	
30	7	0.332	.332	.332	✓	.050	
29	8	0.384	.385	.385	✓	.053	
28	9	0.435	.435	.435	✓	.050	
27	10	0.485	.485	.485	✓	.050	
26	11	0.536	.536	.536	✓	.051	
25	12	0.587	.587	.587	✓	.051	
24	13	0.638	.639	.639	✓	.052	
23	14	0.688	.690	.689	✓	.050	
22	15	0.740	.740	.740	✓	.051	
21	16	0.791	.791	.791	✓	.051	
20	17	0.840	.841	.841	✓	.050	
19	18	0.891	.891	.891	✓	.050	
18	19	0.942	.942	.942	✓	.051	
17	20	0.994	.995	.995	✓	.053	
16	21	1.045	1.046	1.046	✓	.051	
15	22	1.095	1.095	1.095	✓	.051	
14	23	1.145	1.145	1.145	✓	.050	
13	24	1.196	1.198	1.197	✓	.052	
12	25	1.247	1.248	1.248	✓	.051	
11	26	1.298	1.299	1.299	✓	.051	
10	27	1.347	1.349	1.348	✓	.049	
9	28	1.398	1.399	1.399	✓	.051	
8	29	1.451	1.450	1.451	✓	.052	
7	30	1.500	1.500	1.500	✓	.049	
6	31	1.550	1.551	1.551	✓	.051	
5	32	1.601	1.602	1.602	✓	.051	
4	33	1.653	1.653	1.653	✓	.051	
3	34	1.704	1.704	1.704	✓	.051	
2	~~35~~ 34	~~1.750~~ 1.754	1.754	1.754	✓	~~.048~~ 0.50	(correction)
1	36	1.801	1.806	1.807	✓	~~.055~~ 0.53	
	Bottom	1.829	1.830	1.830	n/a	n/a	

Comments: wires very exposed, needs RTV

Prepared by: Jeff Henrickson Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 27JUN95

LTPP Seasonal Monitoring Program Data Sheet SMP-C04 Function Generator, Multimeter, and Switch Box Checks	Agency Code [31] LTPP Section ID [3018]

Start Time (military): 0900

Test Position	Switch Settings		Voltage (ACV)		Current (ACA)		Measured Resistance R = V/I (ohms)	Known Resistance (ohms)
	I_1, V_1	I_2, V_2	Range Setting	Reading	Range Setting	Reading		
36	36	37	milli	0.5	micro	285.5	R1 = 1.8	R1 = 0.97
37	37	38		26.6		263.7	R2 = 100.7	R2 = 100.7
38	38	39		150.6		150.3	R3 = 1002	R3 = 1003.8
39	39	00		337.4		0.4	R4 = 0.843M:2	R4 = 0.994 M
							ok	
36	36	37		0.6		286.9	R1 =	R1 =
37	37	38		26.7		264.8	R2 =	R2 =
38	38	39		150.9		150.6	R3 =	R3 =
39	39	00		337.5		0.4	R4 =	R4 =
36	36	37		0.6		287.1	R1 =	R1 =
37	37	38		26.7		264.9	R2 =	R1 =
38	38	39		150.9		150.6	R3 =	R1 =
39	39	00		337.6		0.4	R4 =	R2 =

Comments: Resist. values are from 1993 set up of swt. box and do not account for increased swt. resistance.

Prepared by: Robert Van Sambeek

Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 11/Aug/95

LTPP Seasonal Monitoring Program Data Sheet SMP-C05 Rain Gauge Calibration	Agency Code [31] LTPP Section ID [3018]

General Information:

Manufacturer: Texas Electronics Inc,

Model Number: TRP-525M

Serial Number: 12054

Note: The screen should be tacked inside the funnel using silicon at three to four points to prevent loss from wind.

Rain Gauge Calibration Data					
Trial	Start Time (Military)	End Time (Military)	Volume (ml)	Number of Tips	Adjustment[1] No. of Turns
1	1300	1400	473.	95.	+0.9
2	1500	1600	473.	98.	+0.3
3	1600	1700	473.	101.	0.0

[1] Adjust gauge to obtain 100 tips ± 3 for 473 ml of water.

Comments: _____

Prepared by: Jerome Dicks Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 01/Aug/95

Appendix C-1: Instrumentation Installation Information

Appendix C-1 contains the following installation data sheets and associated field notes, as well as, certificate of registration for instrumentation, and photographs documenting the installation:

- Data Sheet SMP-D10: SMP Field Activity Report;
- Data Sheet SMP-I01: List of Installed Instrumentation;
- Data Sheet SMP-I02: Instrumentation Locations;
- Data Sheet SMP-I03: Log of Piezometer Hole;
- Data Sheet SMP-I04: Log of Instrumentation Hole;
- Data Sheet SMP-I05: Field Gravimetric Moisture Contents;
- Data Sheet SMP-I05(A): Lab Gravimetric Moisture Contents;
- Data Sheet SMP-I05(B): Gravimetric Moisture Comparison;
- Data Sheet SMP-I06: TDR Moisture Content;
- Data Sheet SMP-I07: Representative Dry Density;
- Plot of Gravimetric Moisture Results; and
- Installation Photographs.

3 1 S B 9 5 A

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-D10 SMP Field Activity Report	Agency Code [31] LTPP Section ID [3018]

Onsite Datalogger and Instrumentation		
File Name - *.ONS	INSTALL	Comments:
Battery Replace	Yes (No)	Voltages
Repairs/Calib.	INSTALL	
Other:		

Mobile Datalogger		
File Name - *.MOB	MANUAL	Comments: INSTALL
TDR/Resistance Voltages	Sets (0)	
Other:		

Manual Data Collection		
Piezometer	Yes (No)	Comments: INSTALL m
Resistance 2 pt.	Sets (0)	
Resistivity 4 pt.	Sets (0)	
Elevations	Sets (0)	
Distress Survey	Yes (No)	
Long. Dipstick Profile	Yes (No)	
Photos or Video	(Yes) No	Various print, slide, + video
Other:		

FWD and Associated Data		
FWD Testing	Sets (1)	Operator: BRUCE PELKEY
JCP - Snap Rings	Sets (0)	
JCP - Faulting	Sets (0)	
Other:		

IF REQUIRED, ATTACH SKETCHES TO THIS DATA SHEET

Comments: See additional sheets

Prepared by: [signature] Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 10/AUG/95 Daylight Savings Time (Y) or N: N Y

3 1 S B 9 5 A

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-I01 Instrumentation Installed and Participants	Agency Code [3 1] LTPP Section ID [3 0 1 8]

List of Equipment:

Equipment	Quantity	Serial Number(s)
Instrument Hole:		
Thermistor Probe	0 1	3 1 B T
Resistivity Probe	0 1	3 1 B R
TDR Sensors	1 0	3 1 B 0 1 to 3 1 B 1 0
Equipment Cabinet:		
Campbell Scientific CR10 Datalogger	0 1	1 6 5 4 1
Battery Package	0 1	5 5 3 8
Weather Station:		
Rain Gauge	0 1	1 2 0 5 4
Air Temperature Probe	0 1	3 1 B A T
Radiation Shield	0 1	3 1 B — —
Observation Piezometer/Bench Mark:	*	n/a

List of Participants: * DOT INSTALLED BENCHMARK * DOT PROVIDED DOT PIEZOMETER

Name of Participant	Agency/Employer
ROBERT VAN SAMBEEK	BRAUN INTERTEC CORP
RON URBACH	" " "
BRUCE PELKEY	" " "
NEBRASKA DOT	NEBRASKA DOT. "

Prepared by: Robert Van Sambeek Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 0 9 / A u g / 9 5

11.9" PCC
5.6" SC
17.5

31 S B 9 5 A

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-I02 Installed Instrument Location	Agency Code [31]
	LTPP Section ID [3018]

Longitudinal and Transverse Location of Instrumentation:

Instrument	Station (Customary Units)		Offset (m)[1]	
	Planned	Actual	Planned	Actual
Instrumentation Hole	0-22	0-21	+0.76	+0.76
Observation Piezometer	0+13	0+11	-3.35	-3.40
Equipment Cabinet	0-22	0-21	-7.62	-7.60
Weather Station	0-22	0-21	-7.92	-8.10
DOT BM	2	0+31		-20.80

68'
1' from ROW

[1] Transverse distance in meters from pavement edge (see LTTP Manual for FWD Testing) with (+) values toward mid-lane and (-) towards shoulder

Depth Location of Instrumentation:

Instrument		Depth from Pavement Surface to Top of Probe (m)		Comments
		Planned	Actual	
Thermistor Probe	Metal Top 1"	0.025	0.020	
	Metal Bottom 11"	0.280	*0.280	*Estimated from slope into the pavement
	PVC Top 19.5"	0.495	0.476	
Resistivity Probe	19.5"	0.495	0.495	

PIEZ. IS 0.1892 meters below the P.E. @ Sta. 0+11 on 11-Aug-95.

TDR Number	Depth from Pavement Surface to Probe (m)		Comments
	Planned Location	Actual Location	
17.5 → 1	0.600	0.610	0.456 depth to place SC
23.5 2	0.750	0.752	
29.5 3	0.900	0.907	
35.5 4	1.055	1.016	off 2'
41.5 5	1.205	1.087	
47.5 6	1.360	1.220	~~1.220~~ Conduit in - Cored in at 18" from edge of hole - not able to dig all out.
53.5 7	1.510	1.513	
59.5 8	1.665	1.667	
65.5 9	1.970	1.932	
71.5 10	2.275	2.280	Hole 90" deep.

ATTACH TOP-VIEW SKETCH OF INSTRUMENTATION HOLE SHOWING DIRECTION OF TRAFFIC AND LOCATION OF THERMISTOR AND RESISTIVITY PROBES. LABEL PROBES "T" AND "R", RESPECTIVELY

Prepared by: [signature] Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 10 / Aug / 95

31 SB95A

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-I03 Log of Piezometer Hole	Agency Code [31] LTPP Section ID [3018]

Operator: _____ Equipment Used: CME 55

Location: Station: 0+11 Offset: −3.40 m (from lane edge)

Bore Hole Diameter: 160 mm Auger Type: 6¼" HOLLOW STEM AUGER

Scale (m)	Depth from Surface[1] (m)	Material Description	Material Code[2]
0.5			
1.0			
1.5		SP SAND BROWN DRY TO MOIST	202
2.0	2.2		
2.5			
3.0		SM SILTY SAND BROWN MOIST	214
3.5	3.5		
4.0		SM SILTY SAND WET	214
4.5			
5.0		SEE ATTACHED SHEET	

[1] Format: __.____ m; [2] Format: ____

Prepared by: RON URBACH Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 10/AUG/95

BRAUN[SM]
INTERTEC

313018 315B 95 B

10-AUG 95 PIEZOMETER

DOT INSTALLED A BENCH MARK.

BECAUSE OF HIGH GROUND WATER. THE DOT SAID THE HOLE WOULD CAVE IN, AFTER THE AUGER WAS REMOVED AND BEFORE THE PIEZOMETER COULD BE PUT IN PLACE. THIS PIEZOMETER WOULD NOT HAVE TO BE USED FOR A BECHMARK.

THE DOT PROPOSED TO INSTALL THE PIEZOMETER IN SIDE OF THE HOLLOW STEM AUGER THEN REMOVE THE AUGER, THIS IS STANDARD PRACTICE FOR THEM

THE PIEZOMETER WAS PLASTIC PIPE. IN SIDE DIAMETER OF 52mm (2") OUT SIDE DIAMETER 58mm (2¼"). THE SECTIONS OF PIPE HAD THREAD CONNECTIONS, THE BOTTOM 5' SECTION WAS SLOTTED. THE BOTTOM 6'± WAS WRAPPED WITH FILTER FABRIC

WE PLACED THE PIEZOMETER THEN CUT OFF THE TOP TO THE HIGHT WE WANTED. THE LENGTH WAS 4.76 M

AS THE HOLLOW STEM AUGER WAS REMOVED THE SAND CAVED IN AROUND THE PIEZOMETER, THE SAND WAS VERY CLEAN, LIKE THE FILTER SAND WE WERE GOING TO USE.

10 F

BRAUN[SM]
INTERTEC

313018
10-8-95

WE USED A TAMPING ROD TO COMPACT THE SAND. AT A DEPTH OF ABOUT 2.66 m WE ADDED BENTONITE CHIPS FOR THE SEAL. THE BENTONITE WAS ALSO COMPACTED WITH THE TAMPING ROD. THE TOP OF THE BENTONITE WAS AT 2.29m FOR A THICKNESS OF 0.37 m.
AFTER THE BENTONITE WAS IN PLACE THE HOLLOW STEM AUGER WAS REMOVED. SOIL THAT WAS REMOVED FROM THE BORE HOLE WAS THEN USED AS BACKFILL. THIS FILL SAND WAS USED TO A DEPTH OF ABOUT 0.61m (2'). THE 4" DIAMATER PROTECTION PIPE WAS ABOUT .61m (2') LONG.
CONCRETE MIX WAS PLACED AROUND THE PROTECTIVE PIPE TO ABOUT 6"-8" BELOW GROUND SURFACE.

ONE 5 GAL PAIL OF SOIL WAS TAKEN FROM THE 1.4m TO 2.1 m. THIS SAMPLE MAY BE USED FOR TESTING AT A LATER DATE.

RON URBACH
10-AUG-95

31 S B 9 5 A

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-I04 Log of Instrumentation Hole	Agency Code [31] LTPP Section ID [3018]

Operator: _____ Equipment Used: CME 55

Location: Station: 0-21 Offset: +0.76 m (from lane edge)

Bore Hole Diameter: 290. mm 11.5 CUT DOWN

Scale (m)	Strata Change[1] (m)	Material Description	PAIL II	Material Code[2]
0.10 – 0.30	.31	PCC		730
0.40	.45	SOIL CEMENT	1	339
0.50 – 0.60	.64	SP SAND BROWN DRY TO MOIST	2	202
0.70 – 0.80	.86	SP SAND BROWN DRY TO MOIST	3	202
0.90 – 1.00	1.09	SP SAND BROWN MOIST	4	202
1.10	1.18	SP SAND BROWN MOIST	5	202
1.20 – 1.30	1.35	SM SILTY SAND BROWN MOIST	6	214
1.40 – 1.50	1.52	SM SILTY SAND BROWN MOIST	7	214
1.60	1.66	SM SILTY SAND BROWN MOIST	8	214
1.70 – 1.80	1.84	SM SILTY SAND BROWN MOIST TO WET	9	214
1.90	1.96	SM SILTY SAND BROWN MOIST	10	214
2.00 – 2.10	2.10	SM SILTY SAND BROWN MOIST	11	214
2.20 – 2.30	2.32	SM SILTY SAND	12	214
2.40 – 2.50				

[1] Format: __.____ m; [2] Format: ____

Prepared by: RON URBACH Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 10/AUG/95

LTPP Seasonal Monitoring Program Data Sheet SMP-I05 Field Gravimetric Moisture Content	Agency Code [31] LTPP Section ID [3018]

TDR Probe	Probe Depth[1] (m)	Moisture Sample No.	Pan No.	Wt. of Pan (gms) = A	Wt. of ~~Pan~~ + Wet Soil (gms) = B	Wt. of Pan + Dry Soil (gms) = C	Wt. of Dry Soil (gms) = D = C - A	Wt. of Water (gms) = E = B - C	Moisture Content (%) = w = E/D * 100
1	0.600	1	1	____.__	513.4	____.__	477.8	35.6	7.5
2	0.750	2	1	____.__	456.6	____.__	428.8	27.8	6.5
3	0.900	3	2	____.__	447.0	____.__	435.0	12.0	2.8
4	1.055	4	1	____.__	353.3	____.__	340.8	12.5	3.7
5	1.205	5	2	____.__	469.4	____.__	453.8	15.6	3.4
6	1.360	6	1	____.__	326.9	____.__	312.4	14.5	4.6
7	1.510	7	2	____.__	322.9	____.__	298.3	24.6	8.2
8	1.665	8	1	____.__	328.3	____.__	292.0	36.3	12.4
9	1.970	9	3	____.__	316.4	____.__	292.5	23.9	8.2
10	2.275	10	1	____.__	327.6	____.__	306.7	20.9	6.8
	1 POINT PROCTOR	11	2		334.7		321.2	13.5	4.2

[1] Distance in meters from pavement surface to TDR probe

Comments: _____

Prepared by: NEBRASKA DOT Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 10/AUG/95

LTPP Seasonal Monitoring Program Data Sheet SMP-105 (LAB)(A) LAB ~~FIELD~~ Gravimetric Moisture Content	Agency Code SHRP [31] LTPP Section ID [3018]

TDR Probe	Probe Depth[1] (m)	Moisture Sample No.	Can or Pan No.	Wt. of Pan (gms) = A	Wt. of Pan + Wet Soil (gms) = B	Wt. of Pan + Dry Soil (gms) = C	Wt. of Dry Soil (gms) = D = C - A	Wt. of Water (gms) = E = B - C	Moisture Content (%) = w = E/D * 100
1	0.600	595-434	1	142.9	525.5	500.5	357.6	25.0	7.0
2	0.750	435	2	147.1	504.3	484.6	337.5	19.7	5.8
3	0.900	436	3	159.2	674.6	660.1	500.9	14.5	2.9
4	1.055	437	4	143.5	576.7	564.0	420.5	12.7	3.0
5	1.205	438	5	157.0	474.9	464.8	307.8	10.1	3.3
6	1.360	439	6	142.6	482.6	468.7	326.1	13.9	4.3
7	1.510	440	7	163.1	476.8	445.4	282.3	31.4	11.1
8	1.665	441	8	143.5	548.5	504.9	361.4	43.6	12.1
9	1.970	442	9	157.5	543.2	513.8	356.3	29.4	8.3
10	2.275	443	10	163.3	609.0	578.2	414.9	30.8	7.4
11	1 POINT PROCTOR	444	11	141.8	449.0	436.7	294.9	12.3	4.2

[1] Distance in meters from pavement surface to TDR probe

Comments: Received 16-AUG-95 from George Woolstrum NE Dept. of Roads (fax 402-479-3975)

Prepared by: NE Dept. of Roads Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 11/AUG/95

Data Sheet SMP-105: ~~FIELD~~ LAB Gravimetric Moisture Contents

LTPP Seasonal Monitoring Program Data Sheet SMP-I05 (B) Gravimetric Moisture Comparison	Agency Code [31] LTPP Section ID [3018]

TDR	SMP-I02 TDR Depth (in)	SMP-I04 Material Code	Lab Data Dry Density (pcf)	TDR Installation Data		Gravimetric Moistures		Comments
				SMP-I06 La (m)	Calculated Gravimetric (percent)	SMP-I05 Field (percent)	SMP-I05A Lab (percent)	
1	0.610	202	115.1	0.44	(4.1)	7.5	7.0	Low TDR value
2	0.752	202	115.1	0.61	9.4	6.5	5.8	
3	0.907	202	115.1	0.46	4.7	2.8	2.9	
4	1.016	202	115.1	0.47	5.0	3.7	3.0	
5	1.087	202	115.1	0.47	5.0	3.4	3.3	
6	1.220	214	115.1	0.55	7.4	4.6	4.3	
7	1.513	214	115.1	0.79	15.4	(8.2)	11.1	Field moisture is suspect
8	1.667	214	115.1	0.76	14.4	12.4	12.1	
9	1.932	214	115.1	0.63	10.1	8.2	8.3	
10	2.280	214	115.1	0.55	7.4	6.8	7.4	

TDR Gravimetric moistures calculated using equations on pages II-2 and II-5 of FHWA-RD-94-110 with La = 0.203 m, and Vp = 0.99.

Comments: Dry Density from Form 504 with test location at sta. 5+57 (115.1 pcf) - SMP-I07 HAS 113.7 pcf for Subgrade soil.

Prepared by: RSV Employer: Braun Intertec Corporation Date (dd/mmm/yy): 10/DEC/15

$$\omega = \left(-330.72 + 4526.78\,La^2 - 2103.88\,La^4 + 402.25\,La^6\right)/\gamma_d$$; La (meters), γ_d (pcf), ω (%)

3 1 S B 9 5 A

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-I06 TDR Moisture Content	Agency Code [31] LTPP Section ID [3018]

Required Settings:

Dist./Division: 0.25 m
Phase Velocity: 0.99
Noise Filter: 1 average

Probe Number	Probe Depth[1] (m)	Time (military)	Apparent Length (m)	Dielectric Constant[2]	Comments
1	0.610	(1)	0.44	4.79	Zero slope
2	0.752		0.61	9.21	
3	0.907		0.46	5.24	Zero slope
4	1.016		0.47	5.47	
5	1.087		0.47	5.47	
6	1.220		0.55	7.49	
7	1.513		0.79	15.45	
8	1.667		0.76	14.30	
9	1.932		0.63	9.82	
10	2.280		0.55	7.49	

[1] Distance in meters from pavement surface to TDR probe
[2] Dielectric constant is determined as follows:

$$\varepsilon = \left[\frac{(L_a)}{(L)(V_p)}\right]^2 = \left[\frac{(D_2 - D_1)}{(L)(V_p)}\right]^2$$

where ε = dielectric constant; L_a = apparent length of probe, m; L = actual length of probe units (= 0.203 m (8 in) for FHWA probes); V_p = phase velocity setting (= 0.99).

ATTACH TDR TRACES TO THIS DATA SHEET.

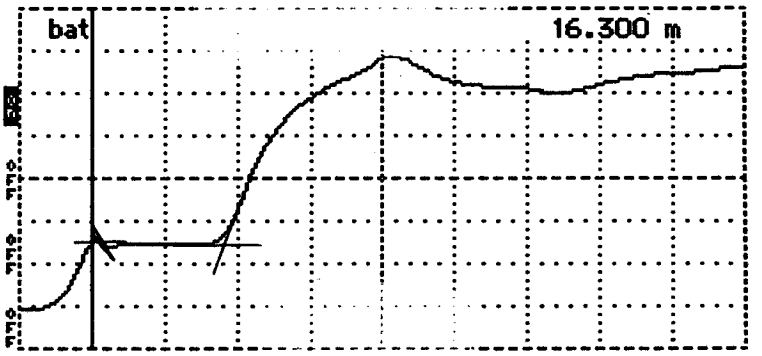
Comments: (1) NOT RECORDED, ALL PROBES PLACED DURING THE AFTERNOON

Prepared by: Robert Von Sonnek Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 10 / AUG / 95

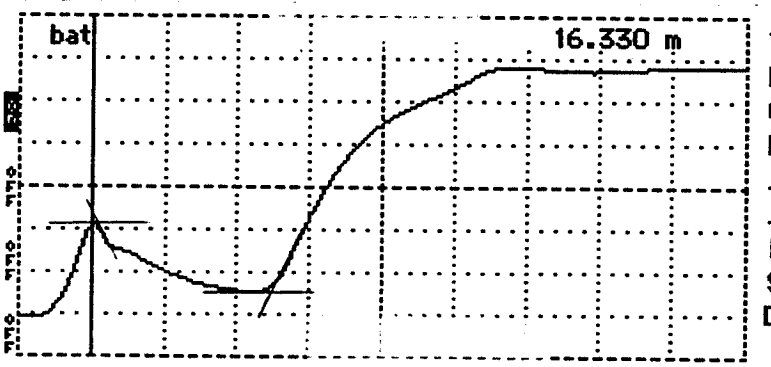
10 - Aug. - 1995 | DBNX92700B6 | TDR TRACES - INSTALL (1/2) 31B

sor ..... 16.300 m
tance/Div..... .25 m/div
al Scale.... 141 mρ/div
..... 0.99
se Filter..... 1 avg
ver..... bat



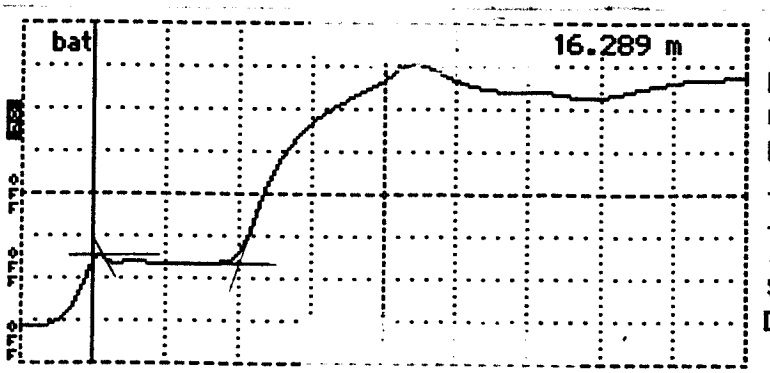
Tektronix 1502B TDR
Date 8-10-95
Cable 31B01
Notes INSTALL
Input Trace
Stored Trace
Difference Trace

sor ..... 16.330 m
ance/Div..... .25 m/div
tical Scale.... 96.9 mρ/div
..... 0.99
e Filter..... 1 avg
er..... bat



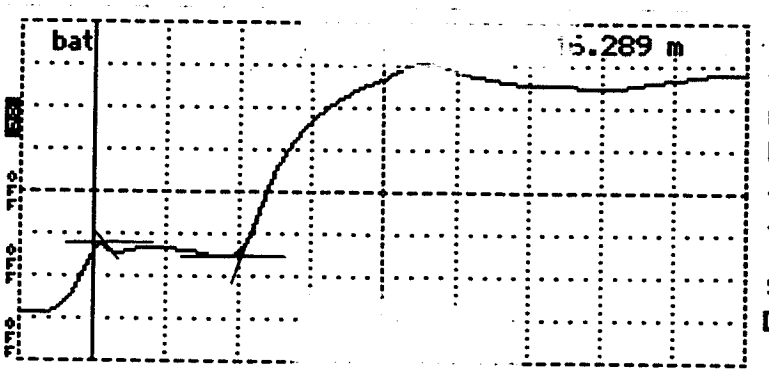
Tektronix 1502B TDR
Date 8-10-95
Cable 31B02
Notes INSTALL
Input Trace
Stored Trace
Difference Trace

sor ..... 16.289 m
...../div..... .25 m/div
...cale.... 133 mρ/div
..... 0.99
..... 1 avg
..... bat



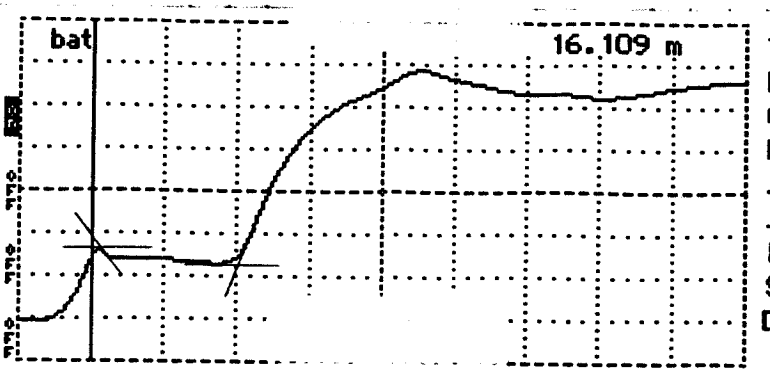
Tektronix 1502B TDR
Date 8-10-95
Cable 31B03
Notes INSTALL
Input Trace
Stored Trace
Difference Trace

..... 16.289 m
..... .25 m/div
...cale.... 133 mρ/div
..... 0.99
Filter..... 1 avg
..... bat



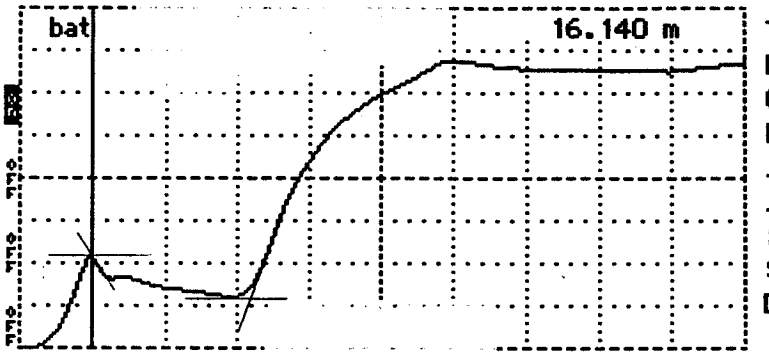
Tektronix 1502B TDR
Date 8-10-95
Cable 31B04
Notes INSTALL
Input Trace
Stored Trace
Difference Trace

..... 16.109 m
..... .25 m/div
..... 133 mρ/div
..... 0.99
..... 1 avg
..... bat



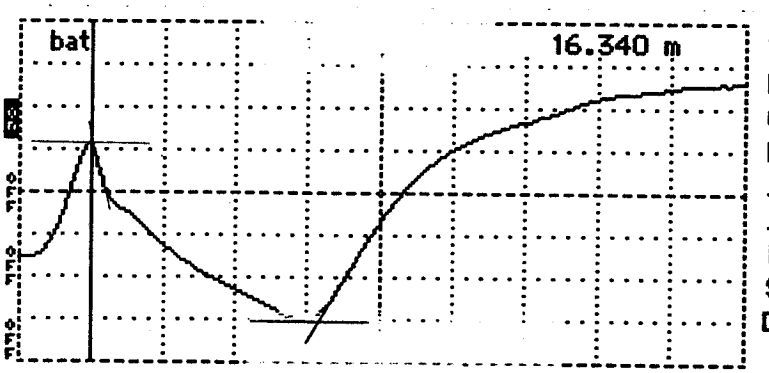
Tektronix 1502B TDR
Date 8-10-95
Cable 31B05
Notes
Input Trace
Stored Trace
Difference Trace

.....16.140 m
tance/Div..... .25 m/div
Scale.... 100 mΩ/div
.....0.99
Filter..... 1 avg
.....bat



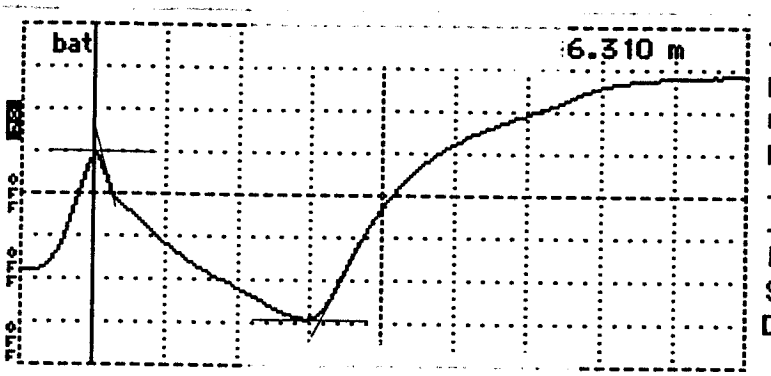
Tektronix 1502B TDR
Date 8-10-95
Cable 31B06
Notes INSTALL
Input Trace
Stored Trace
Difference Trace

.....16.340 m
tance/Div..... .25 m/div
Scale.... 70.6 mΩ/div
.....0.99
Filter..... 1 avg
.....bat



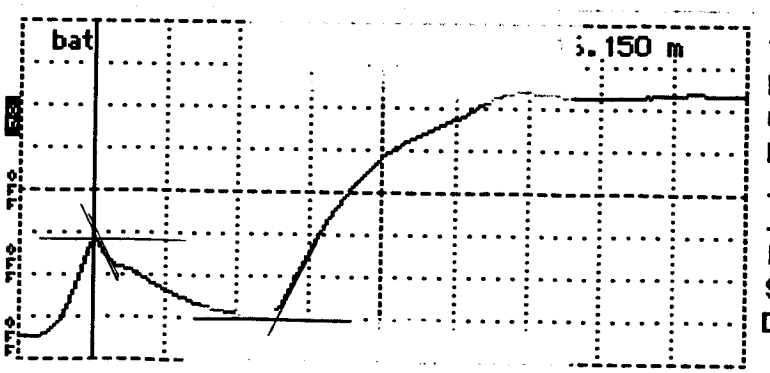
Tektronix 1502B TDR
Date 8-10-95
Cable 31B07
Notes INSTALL
Input Trace
Stored Trace
Difference Trace

.....16.310 m
tance/Div..... .25 m/div
Scale.... 72.7 mΩ/div
.....0.99
Filter..... 1 avg
.....bat



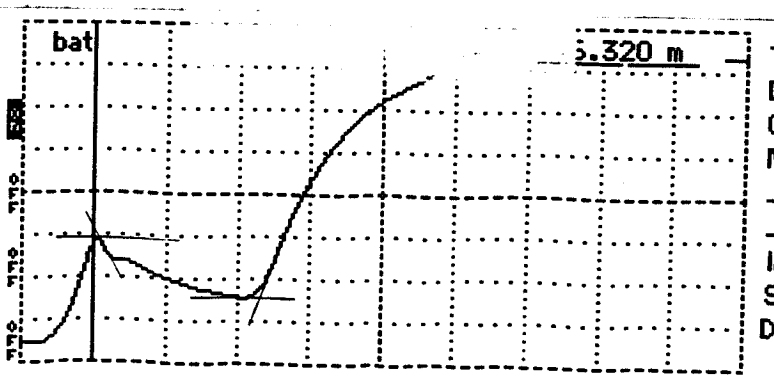
Tektronix 1502B TDR
Date 8-10-95
Cable 31B08
Notes INSTALL
Input Trace
Stored Trace
Difference Trace

.....16.150 m
tance/Div..... .25 m/div
Scale.... 94.1 mΩ/div
.....0.99
Filter..... 1 avg
.....bat



Tektronix 1502B TDR
Date 8-10-95
Cable 31B09
Notes INSTALL
Input Trace
Stored Trace
Difference Trace

.....16.320 m
tance/Div..... .25 m/div
Scale.... 91.5 mΩ/div
.....0.99
Filter..... 1 avg
.....bat



Tektronix 1502B TDR
Date 8-10-95
Cable 31B10
Notes INSTALL
Input Trace
Stored Trace
Difference Trace

31 1 S B 9 5 A

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-I07 Representative Dry Density	Agency Code [31] LTPP Section ID [3018]

PAIL # 6
1.18m TO 1.35m

Depth of Representative Sample (from pavement surface): 1.27 m

454 gm/#

Dry Density Determination:

a. Tare Weight of Empty Mold: 4259 g (9.38 lb)

b. Weight of Mold and Compacted Soil: 6052 g (13.33 lb)

c. Weight of Compacted Sample (b - a): 1793 g (3.95 lb)

d. Unit Weight of Compacted Soil = [(b - a) / 943.0] = WET 1.90 g/cm³

([(b - a) * 30] = WET 118.5 lb/ft³)
1.0333

e. Dry Density of Compacted Soil = [d / (100 - r)] = DRY 1.82 g/cm³

1.82 X 62.4 = 113.8 ✓

DRY (113.7 lb/ft³)

Moisture Content Determination: FIELD MOISTURE CONTENT

m. Tare Weight of Pan: ____ g

n. Weight of ~~Pan~~ and Moisture Sample: WET 334.7 g

o. Weight of ~~Pan~~ and Dry Sample: 321.2 g

p. Weight of Moisture (n - o): 13.5 g

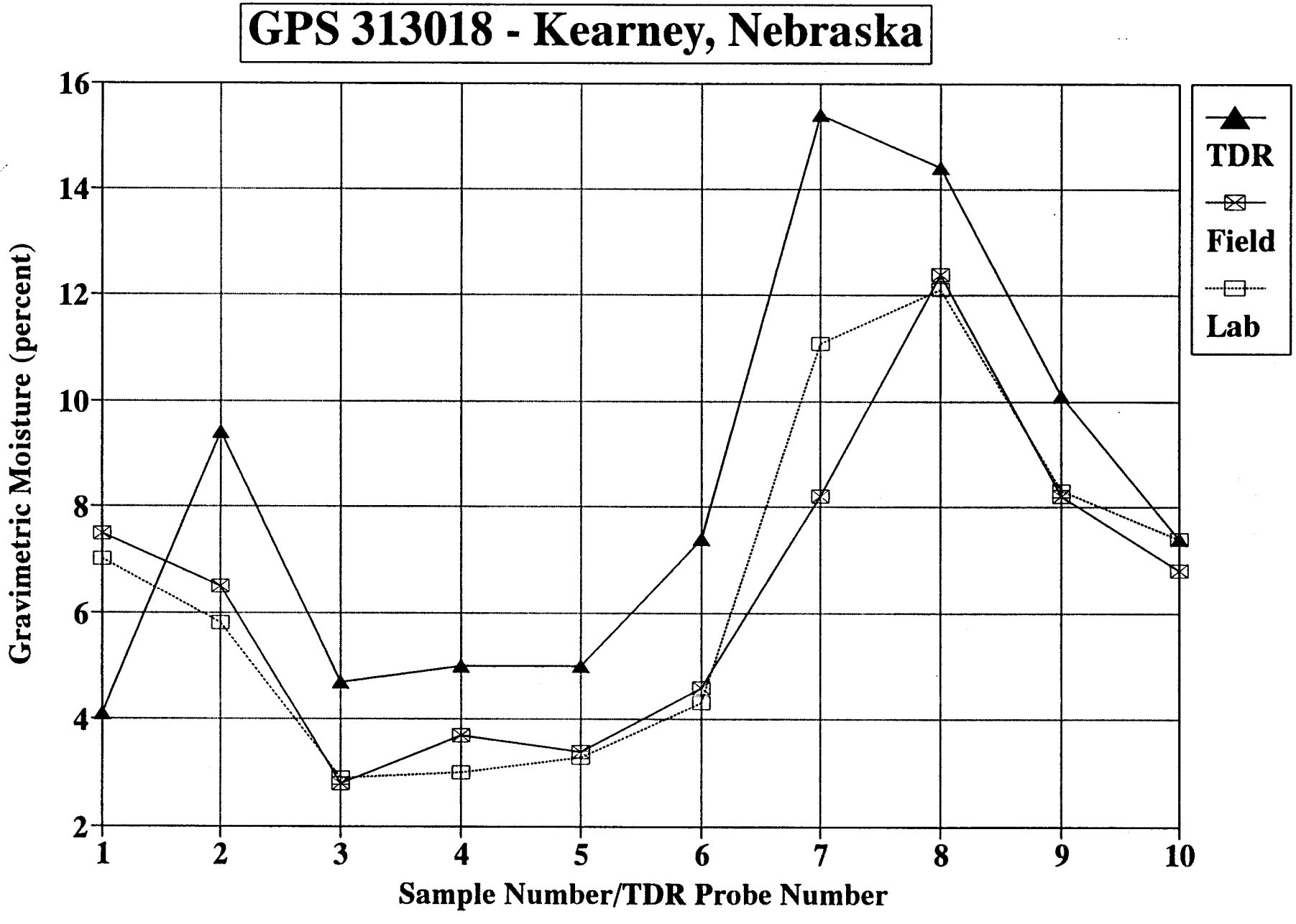
q. Weight of Dry Sample (o - m): 321.2 g

r. Moisture Content by Weight = [(p / (p + q) * 100] = 4.2 %

Comments: _____

Prepared by: RON URBACH Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 10/AUG/95


GPS 313018 - Kearney, Nebraska
Gravimetric Moisture (percent)
16
14
12
10
8
6
4
2
1
2
3
4
5
6
7
8
9
10
Sample Number/TDR Probe Number
TDR
Field
Lab

(1/)

BRAUN℠
INTERTEC

Description: 315B – 313018 SMP INSTALL

Project No: D8NX92700 B6

Date: 09~~8~~-AUG-95 By: RJV

-Aug-95

-Slope site – D.O.T. installing B.M. @ edge of R.O.W. about Sta. 0+20. / Down about 4 ft

-will have to make decision on piezometer – PVC or metal pipe.

- Sands by B.M. were very clean – concern w/ hole that may cave in?

Metal

– set up TDRs, MRC, and resistivity probe to pull through conduit that will be installed under the shoulder.

– weather station assembled.

Police – picked up additional anchors and lag bolts.

9-AUG-1995

Layout points for FWD. and core

Cut 16"ϕ core through 12" PCC – not through the base (bind barrel) for install piezometer – PVC vs. metal – installed through hollow stem auger w/ H_2O in hole.

Setup for H-boring layout – crew brought in boring unit. to place on horizontal platform made with a backhoe. Major setup for 12' conduit. – base extends ≈ 2' outside shoulder – conduit dug in starting out side the base.

Drilled Instr. hole while H-auger still installing. ~~Note~~ No problems w/ sands caving. Drilled through the Soil Cement.

Installed MRC + Resistivity + TDR #10 at same time. Set TDRs #9, 8, +7 before the H-bore pushed ≈ 12" to 18" of material in from side of hole. Dug back out as much material as possible. Had to alter depths for ~~#~~5 and 4 to compensate for ~~to compensate for~~ #6 placed too shallow.

Conduit in about 12" below base. (4"ϕ)

installed TDRs 3 and 2. Pulled ~~an~~ flex conduit into 4"ϕ and pulled cables through. Installed #1. Made special effort to compact area ~~an~~ pushed out by the H-bore Prep core for placement. wire brush

Mixed clean sand 50/50 w/ high early cement in a very stiff mix and compacted in place of the soil cement. Test fit

BRAUN SM
INTERTEC

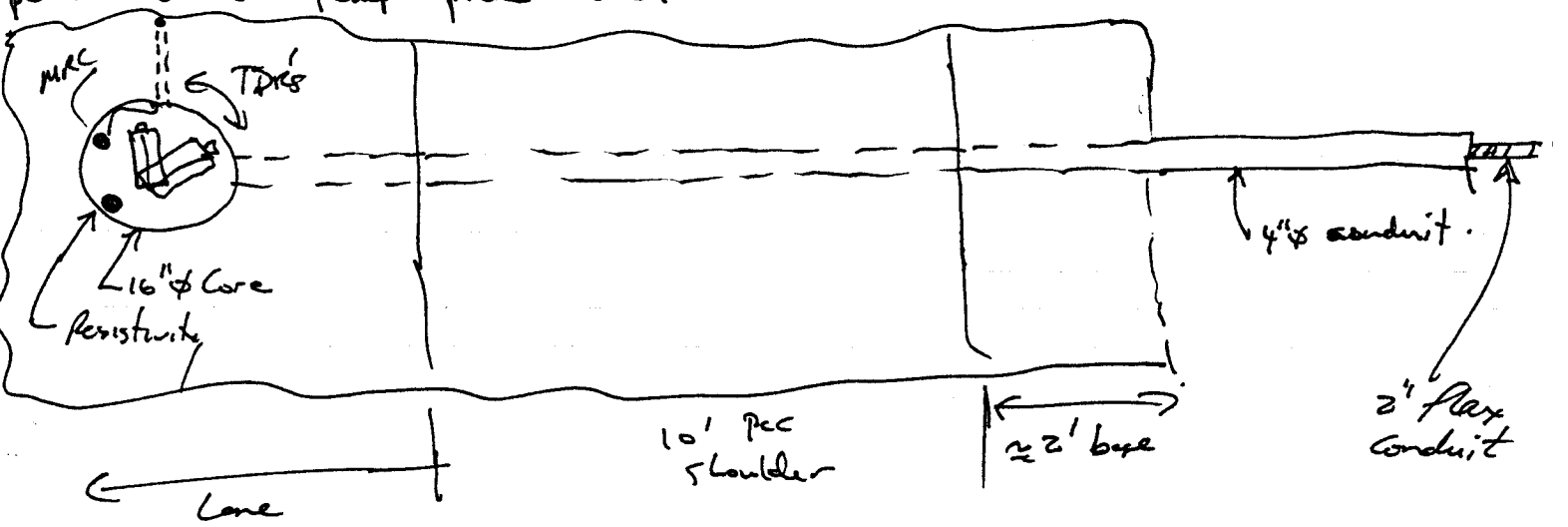
Description: 315B - 313018 SMP INSTALL

Project No: DBNX92700 B6

Date: _____ By: RJV

core in hole - adjusted several times - left ≃ 7/16" high and vibrated into place w/ a tamper.

used Reziweld 1000 epoxy to fill gap around core and pour down temp. probe hole.



while H-bar in final approach the cables were pulled to the far side of the hole. and the hole for the temperature ~~probe~~ probe was drilled. Angle for drill was laid out on a piece of plywood to get drill @ proper angle.

- placed probe in hole and used plumbers putty to hold it in at the bottom end.

adjusted MRC -55 probe depth to 20mm before placing the epoxy.

tipped pole for Air + tipping bucket was placed inside hollow stem because of H_2O fable.

installed cabinet and panel. wired sensors and started data logger

Bruce measured out all test points w/ tape measure.

(31)

BRAUN SM
INTERTEC

Description: 3158 – 313018 – SMP INSTALL.

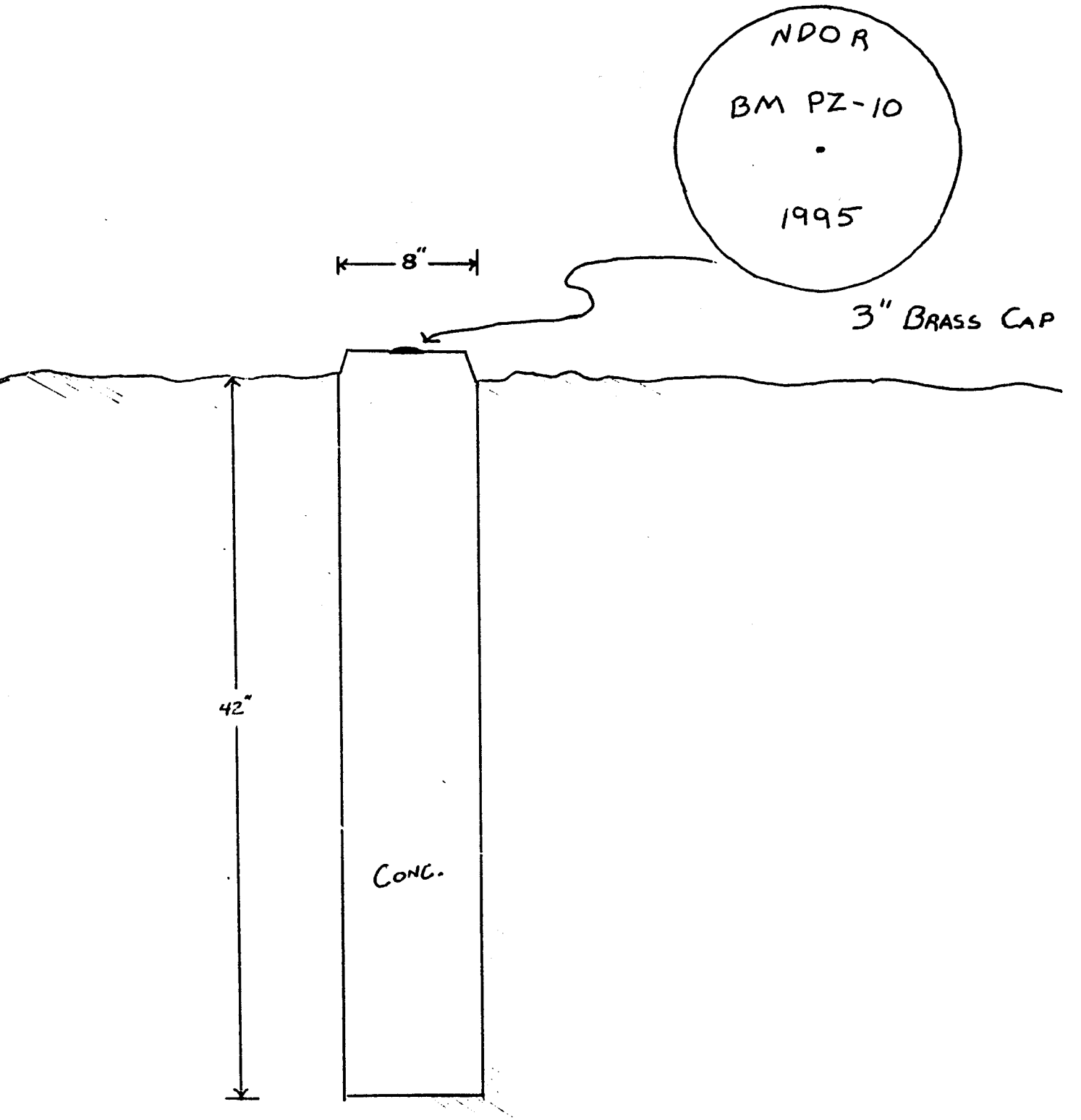
Project No: DBNX 92700 B5 + B6

Date: 11-Aug-95 By: RJV

Finish install
- wiring in cabinet
- sta. + offset values

Monitor
- Resistivity
- Elev.
- No snaprings installed – no joint movement monitored

Pitch vehicles w/ Bruce –
- Bruce drive 91 Ford Back
- Bob + Ron take FWD to Grand Island and fly back


NDOR
BM PZ-10
1995
8"
3" Brass Cap
42"
Conc.

DESCRIPTION OF CONTROL STATION

☐ TRAVERSE ☐ TRIANGULATION ☐ CUT STATION
☒ BENCH MARK ☐ INTERSECTION ☐ SECTION CORNER
☐ RECOVERY NOTE:

PROJECT NO.: _____ NEAREST TOWN: KEARNEY
CONTROL NO.: _____ STATE: NE QUAD: 400991
NAME OF STATION: BM PZ-30 COUNTY: BUFFALO RECOVERED BY: _____ DATE: _____
ESTABLISHED BY: NDOR DATE SET: 8-9-95 DESCRIBED BY: K. McHARGUE DATE: 8-9-95

DISTANCE MONUMENT BELOW GROUND	MONUMENT SET AT GROUND LEVEL	DISTANCE MONUMENT ABOVE GROUND
DEPTH		X HEIGHT 0.01 m
OBJECT USED FOR STATION: MAGNET	STAMPING: BM PZ-30	ELEVATION = 99.806'
CONC. MON. + BRASS CAP	PUNCH MARK 1995	(FROM ASSUMED ELEV.)
PLANE COORDINATES	D.A.F. OR C.M.F.	MODIFIED COORDINATES
X =		X =
Y =		Y =

X SURFACE - STATION MARK
UNDERGROUND - STATION MARK

DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS, AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION.

	OBJECT	BEARING	APPROXIMATE DISTANCE FEET	APPROXIMATE DISTANCE METERS	DIRECTION

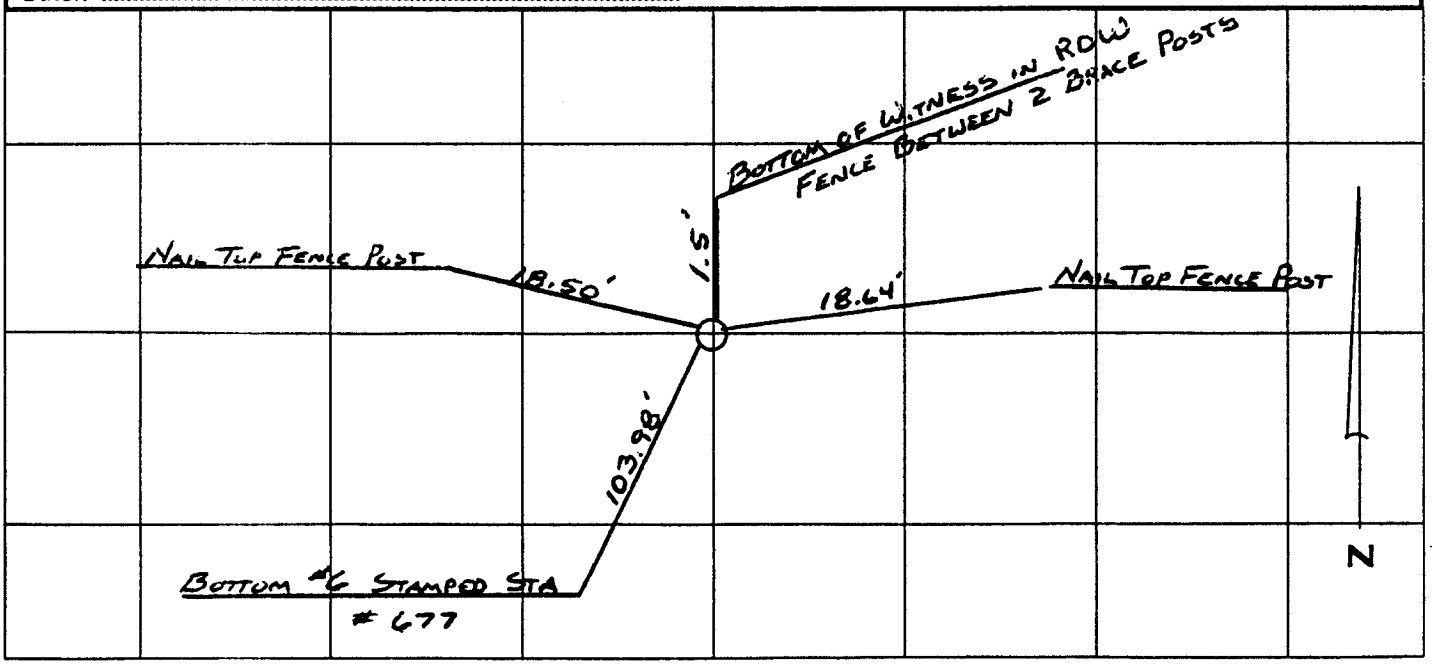
TO REACH FROM JCT I-80 & N-44 SOUTH OF KEARNEY GO EAST ON I-80 APPROX 2.15 MILES TO B.M. (NEAR NORTH R.O.W. FENCE.

NOTE: USEABLE FOR G.P.S.

Ref. Post: 274 + 72 (I-80)
Direction to Object (*N, S, etc.*): N
Distance from ℄ Hwy.: 103.50 (W. BOUND)
Type of Surface or Vegetation: GRASS
Other:

Cor. of Intersection:
Dist. from ℄ Co. Road:
Direction to Object from ℄ Co. Rd. (*N, S, etc.*):

Sec. T. R.



DR Form 75, Sep 86

DESCRIPTION OF CONTROL STATION

☐ TRAVERSE ☒ BENCH MARK ☐ TRIANGULATION ☐ INTERSECTION ☐ CUT STATION ☐ SECTION CORNER ☐ RECOVERY NOTE:

PROJECT NO.: _____ NEAREST TOWN: KEARNEY

CONTROL NO.: _____ STATE: NE QUAD: 400991

NAME OF STATION: BM PZ-20 COUNTY: BUFFALO RECOVERED BY: _____ DATE: _____

ESTABLISHED BY: NDOR DATE SET: 8-9-95 DESCRIBED BY: K. McHARGUE DATE: 8-9-95

DISTANCE MONUMENT BELOW GROUND	MONUMENT SET AT GROUND LEVEL	DISTANCE MONUMENT ABOVE GROUND
DEPTH		X HEIGHT 0.01 m
OBJECT USED FOR STATION: MAGNET	STAMPING: BM PZ-20	ELEVATION = 100.044'
CONC. MON. + BRASS CAP	PUNCH MARK 1995	(FROM ASSUMED ELEV.)
PLANE COORDINATES	D.A.F. OR C.M.F.	MODIFIED COORDINATES
X =		X =
Y =		Y =

X SURFACE - STATION MARK

UNDERGROUND - STATION MARK

DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS, AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION.

OBJECT	BEARING	APPROXIMATE DISTANCE FEET	APPROXIMATE DISTANCE METERS	DIRECTION

TO REACH FROM JCT. I-80 + N-44 SOUTH OF KEARNEY GO EAST ON I-80 APPROX 2.08 MILES TO B.M. NEAR NORTH R.O.W. FENCE.

NOTE. USEABLE FOR G.P.S.

Ref. Post: 274 + 64 (I-80)

Direction to Object (N, S, etc.): N

Distance from ℄ Hwy.: 79.1 (W. BOUND)

Type of Surface or Vegetation: GRASS

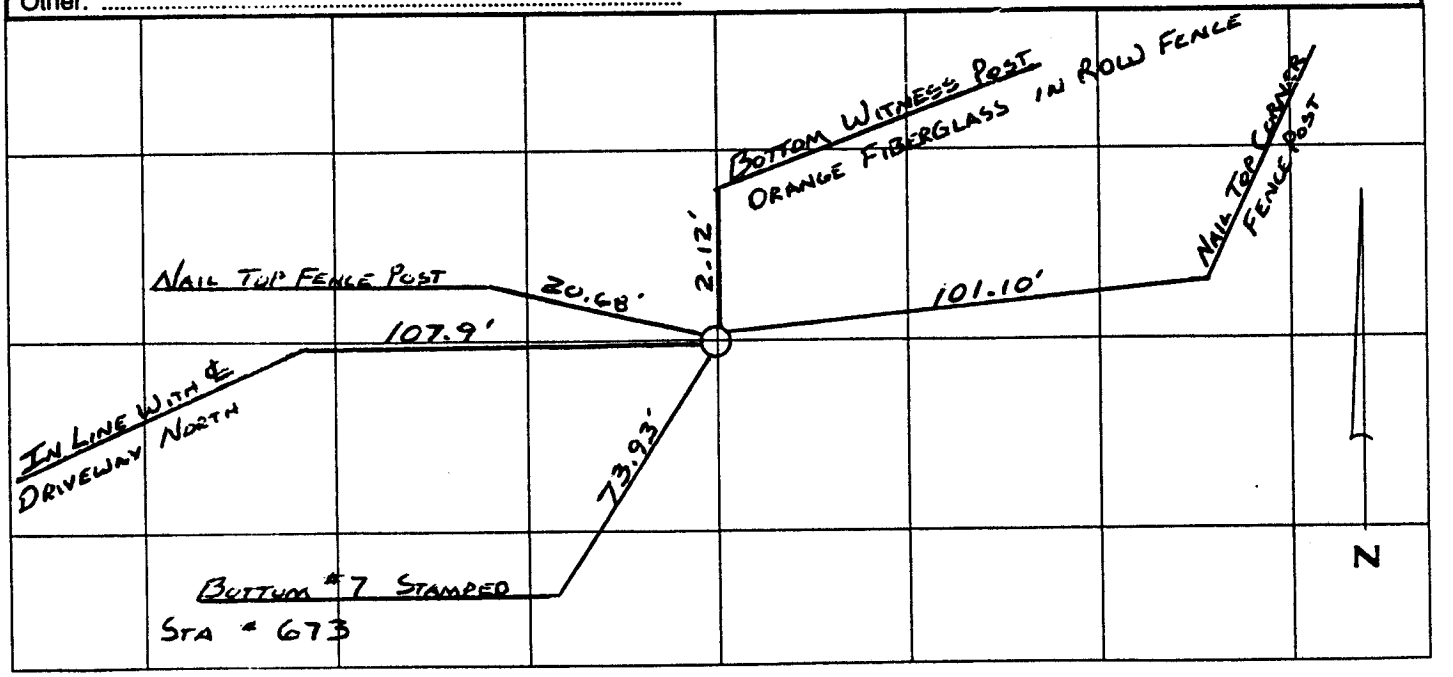
Other:

Cor. of Intersection:

Dist. from ℄ Co. Road:

Direction to Object from ℄ Co. Rd. (N, S, etc.):

Sec. T. R.



DR Form 75, Sep 86

DESCRIPTION OF CONTROL STATION

☐ TRAVERSE ☒ BENCH MARK ☐ TRIANGULATION ☐ INTERSECTION ☐ CUT STATION ☐ SECTION CORNER ☐ RECOVERY NOTE:

PROJECT NO.: _____ NEAREST TOWN: KEARNEY

CONTROL NO.: _____ STATE: NE QUAD: 4D0991

NAME OF STATION: BM PZ-10 COUNTY: BUFFALO RECOVERED BY: _____ DATE: _____

ESTABLISHED BY: NDOR DATE SET: 8-9-95 DESCRIBED BY: K. McHARGUE DATE: 8-9-95

DISTANCE MONUMENT BELOW GROUND	MONUMENT SET AT GROUND LEVEL	DISTANCE MONUMENT ABOVE GROUND
DEPTH		X HEIGHT 0.01 m
OBJECT USED FOR STATION: MAGNET	STAMPING: BM PZ-10	ELEVATION = 100.000'
CONC. MON. + BRASS CAP	PUNCH MARK 1995	ASSUMED
PLANE COORDINATES	D.A.F. OR C.M.F.	MODIFIED COORDINATES
X =		X =
Y =		Y =

X SURFACE - STATION MARK

UNDERGROUND - STATION MARK

DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS, AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION.

OBJECT	BEARING	APPROXIMATE DISTANCE FEET	APPROXIMATE DISTANCE METERS	DIRECTION

TO REACH FROM JCT I-80 + N-44 SOUTH OF KEARNEY GO EAST ON I-80 APPROX 2.0 MILES TO BM NEAR NORTH R.O.W. FENCE.

NOTE: USEABLE FOR G.P.S.

Ref. Post: 274 + 55 (I-80)

Direction to Object (*N, S, etc.*): N

Distance from ℄ Hwy.: 80.2 (W. BOUND)

Type of Surface or Vegetation: GRASS

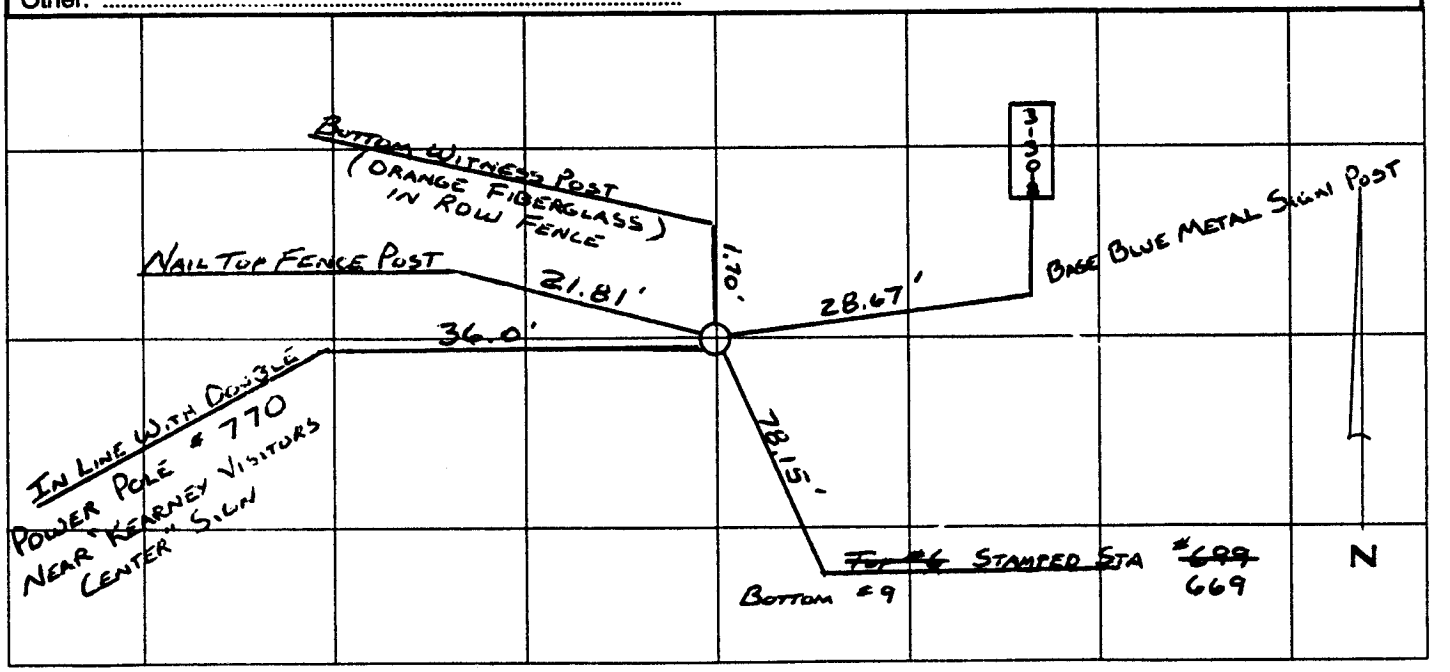
Other: _____

Cor. of Intersection: _____

Dist. from ℄ Co. Road: _____

Direction to Object from ℄ Co. Rd. (*N, S, etc.*): _____

Sec. T. R.



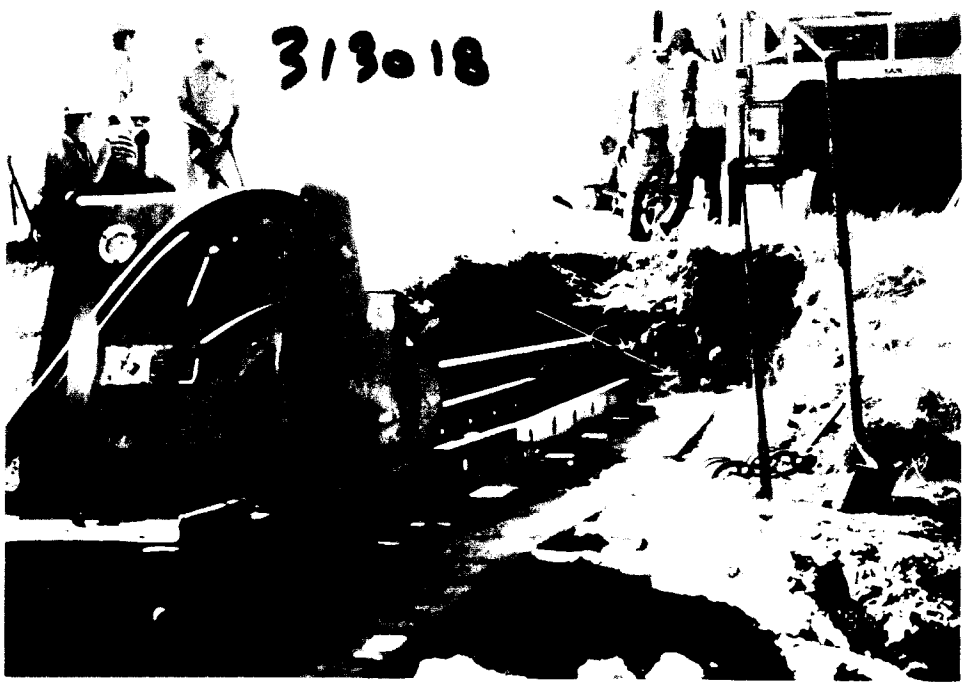
DR Form 75, Sep 86

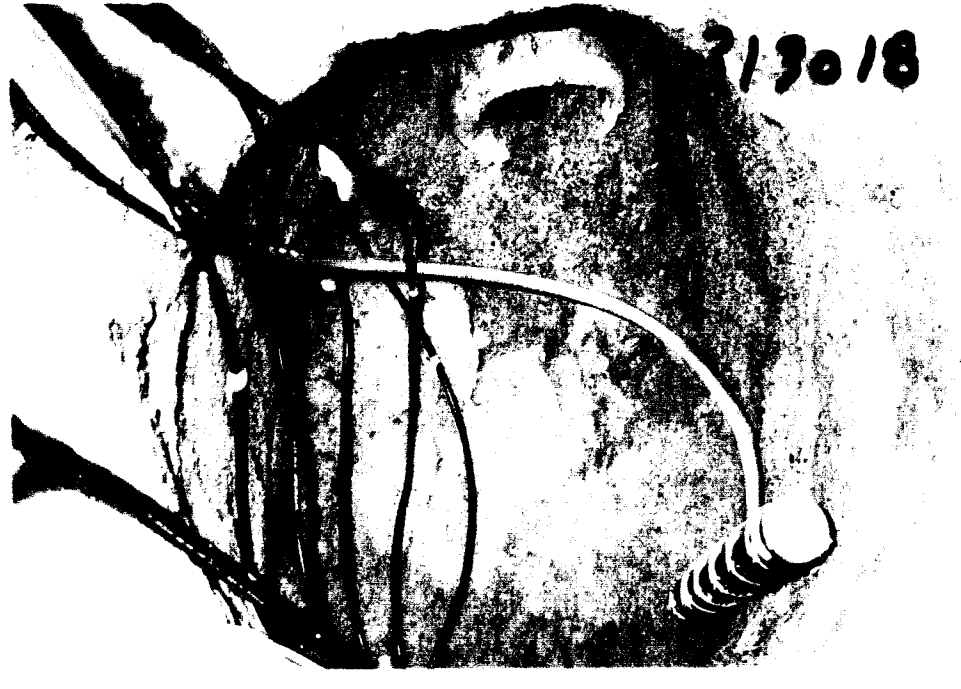

D.O.T.

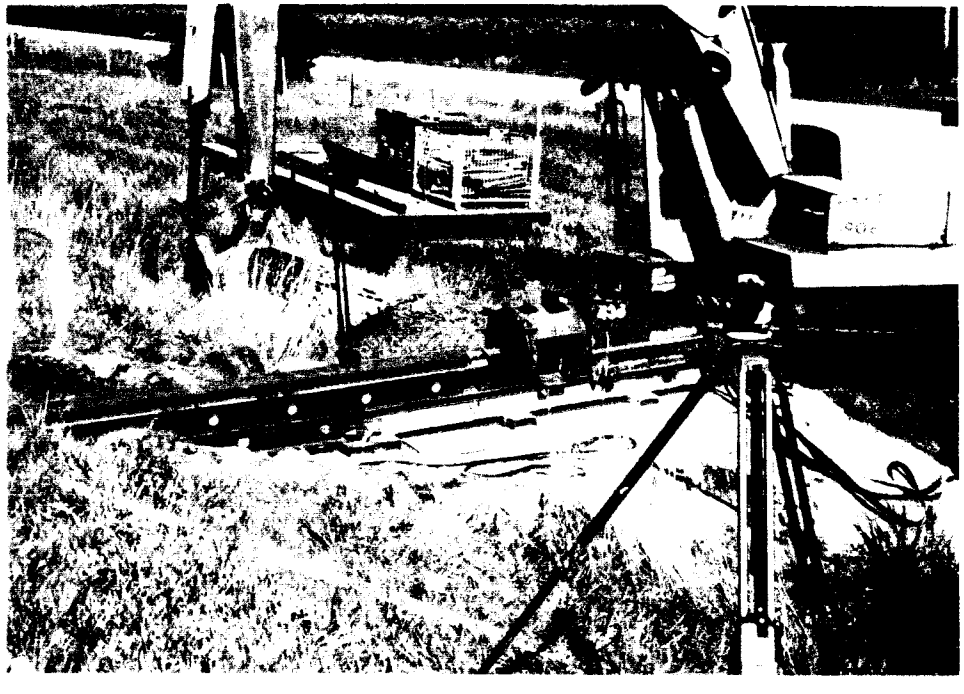

PIEZOMETER


PIEZOMETER

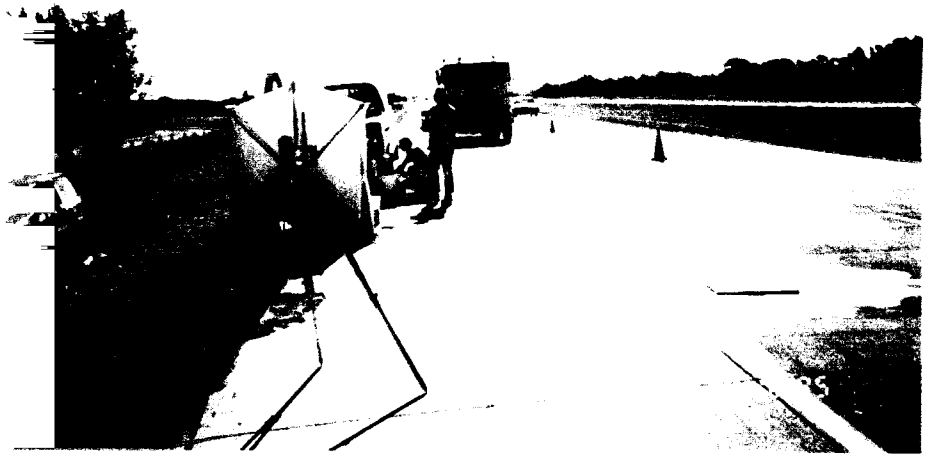

313018
16" ϕ
CORE
(400 mm)

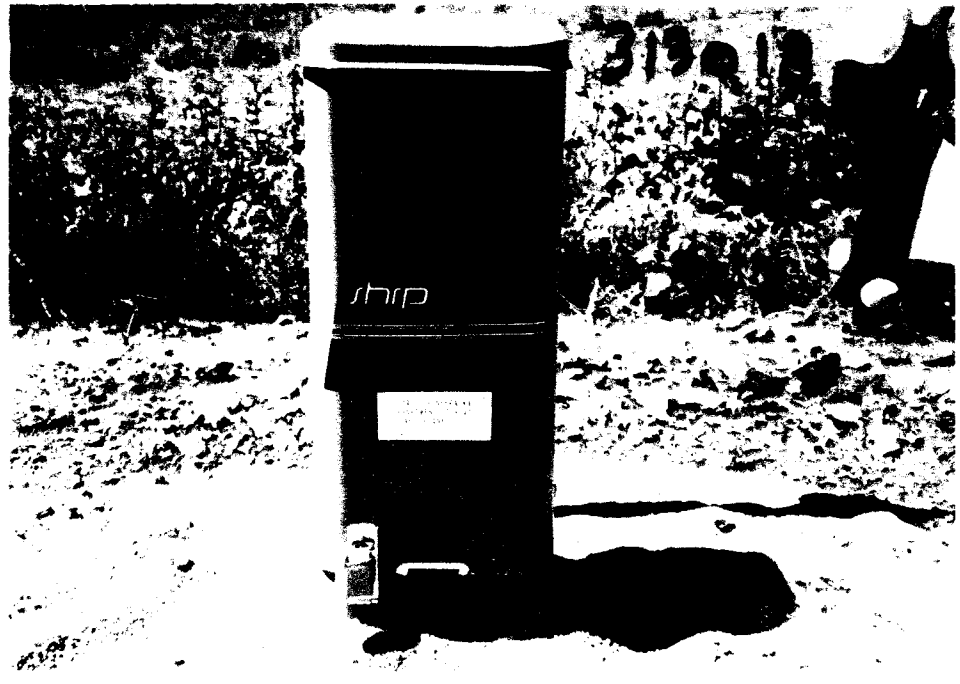

313018


313018

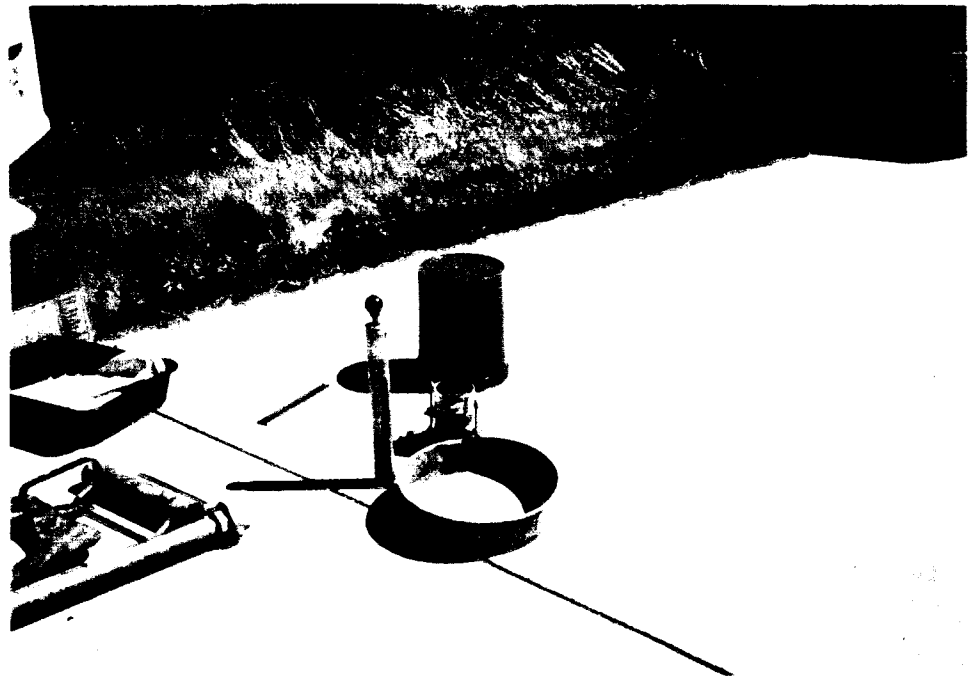


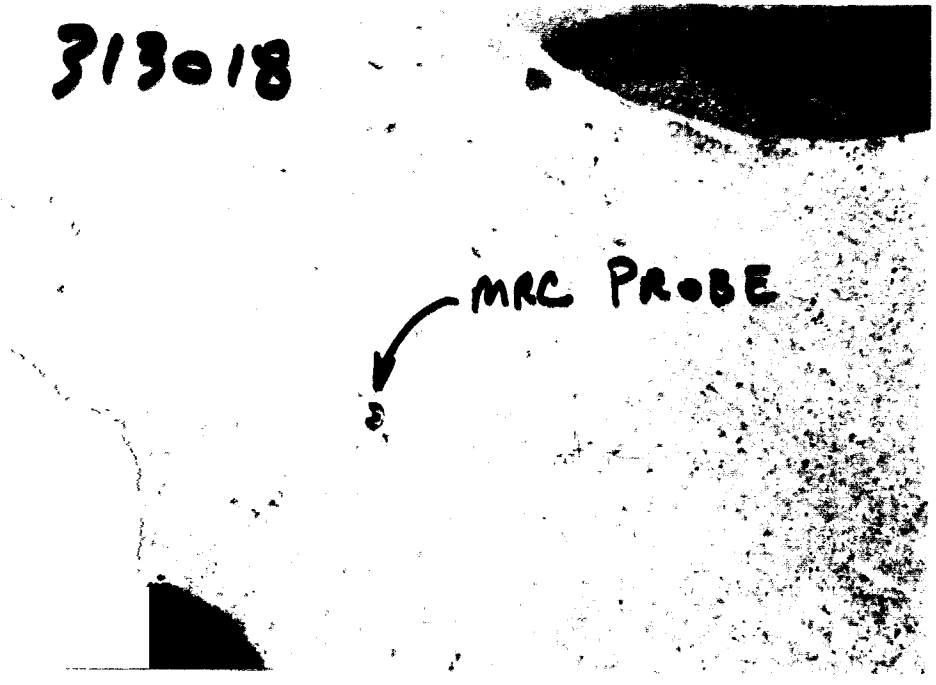
313018



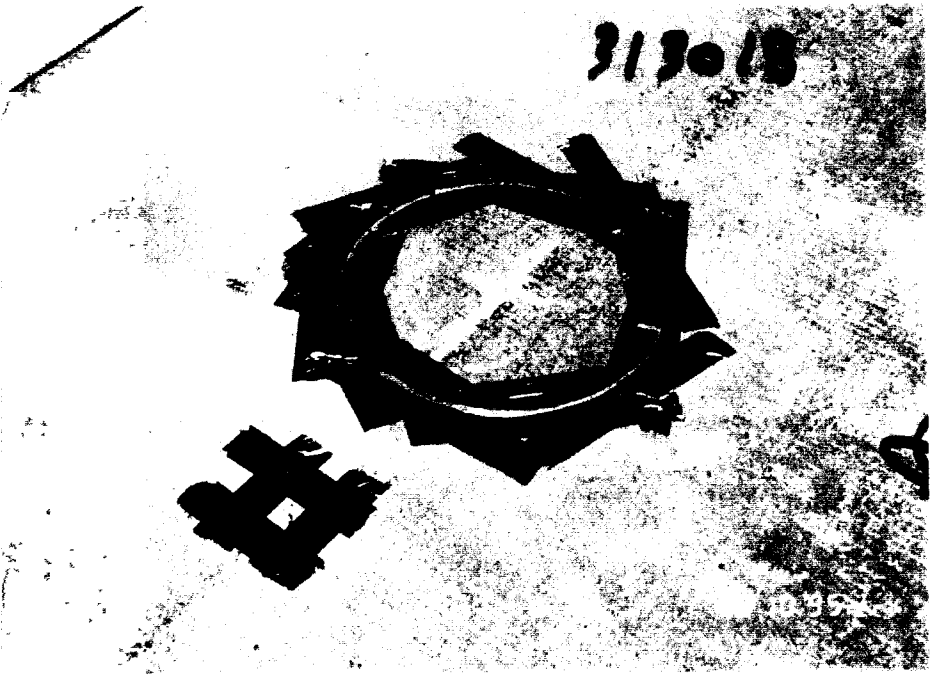


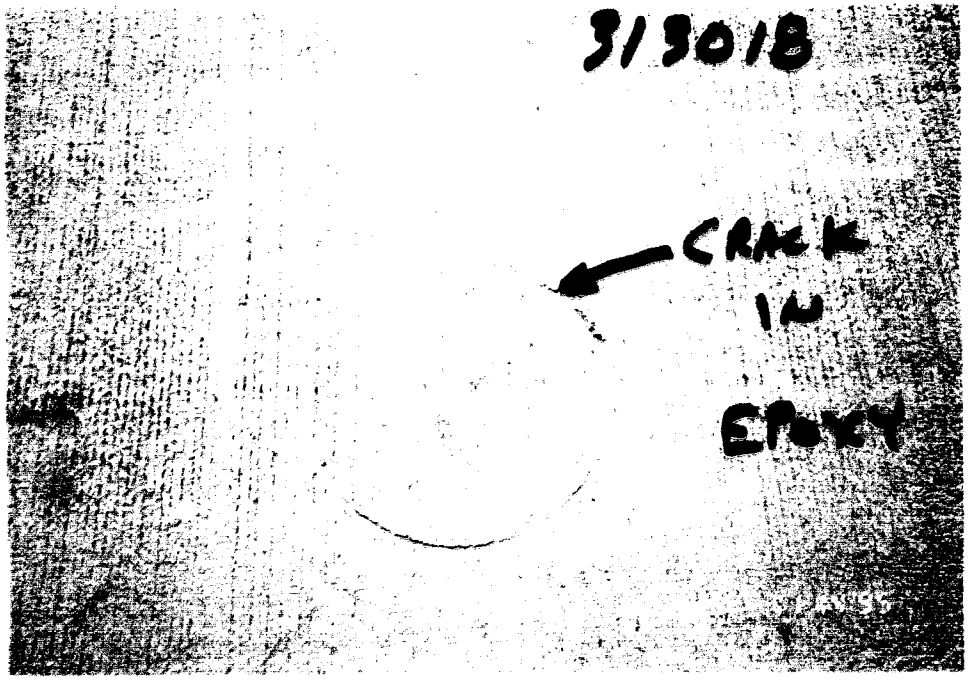
313018




313018
MRC PROBE


313018


313018


313018
CRACK
IN
EPOXY

Appendix D-1: Initial SMP Monitoring Data Collection

Appendix D-1 contains the following data sheets with information collected the day after instrumentation installation:

- Data Sheet SMP-D10: SMP Field Activity Report;
- Data Sheet SMP-D03: Contact Resistance Measurements;
- Data Sheet SMP-D04: Four-Point Resistivity Measurements;
- Data Sheet SMP-D05: Ground Water Table Measurements; and
- Data Sheet SMP-D06: Joint Opening Measurement;
- Data Sheet SMP-D07: Joint Faulting Measurement; and
- Data Sheet SMP-D09: Surface Elevation Measurements - PCC Pavements.

31 SB 95 B

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-D10 SMP Field Activity Report	Agency Code [31] LTPP Section ID [3018]

Onsite Datalogger and Instrumentation		
File Name - *.ONS	315B95BH	Comments: only one day of data
Battery Replace	Yes - (No)	Voltages 12.9
Repairs/Calib.	Finish wiring from install day before	
Other:		

Mobile Datalogger		
File Name - *.MOB	315895BH	Comments:
TDR/Resistance Voltages	Sets (02)	
Other:		

Manual Data Collection		
Piezometer	(Yes) - No	Comments: 3.11 m
Resistance 2 pt.	Sets (1)	
Resistivity 4 pt.	Sets (1)	
Elevations	Sets (1)	15 transverse locations
Distress Survey	Yes - (No)	
Long. Dipstick Profile	Yes - (No)	
Photos or Video	Yes - No	
Other:		

FWD and Associated Data		
FWD Testing	Sets (2)	Operator: Bruce Pelkey
JCP - Snap Rings	Sets (0)	- Not installed yet - no drill guide
JCP - Faulting	Sets (0)	- No fault meter (at FHWA for repair)
Other:		

IF REQUIRED, ATTACH SKETCHES TO THIS DATA SHEET

Comments: _____

Prepared by: RJV / BJP

Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 11 / Aug / 95

Daylight Savings Time (Y) or N): ~~N~~ Y

31 1 5B 95 B

LTPP Seasonal Monitoring Program Data Sheet SMP-M1 (Page 2) Distress Survey of Instrumentation Area	Agency Code [31] SHRP Section ID [3018] Survey Date [11/AUG/95]

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: _____

Additional Comments: Core replaced on 10-Aug-1995 and set in place w/ Rezi weld 1000 epoxy after SMP sensors were installed. No crack seal used because epoxy up even with the surface. will monitor for cracks.

PLEASE REMEMBER TO ATTACH COLOR PHOTOGRAPH(S) OF INSTRUMENTATION AREA TO THIS DATA SHEET.

Prepared by: Robert Van Sambeek Employer: BRAUN INTERTEC COR?.

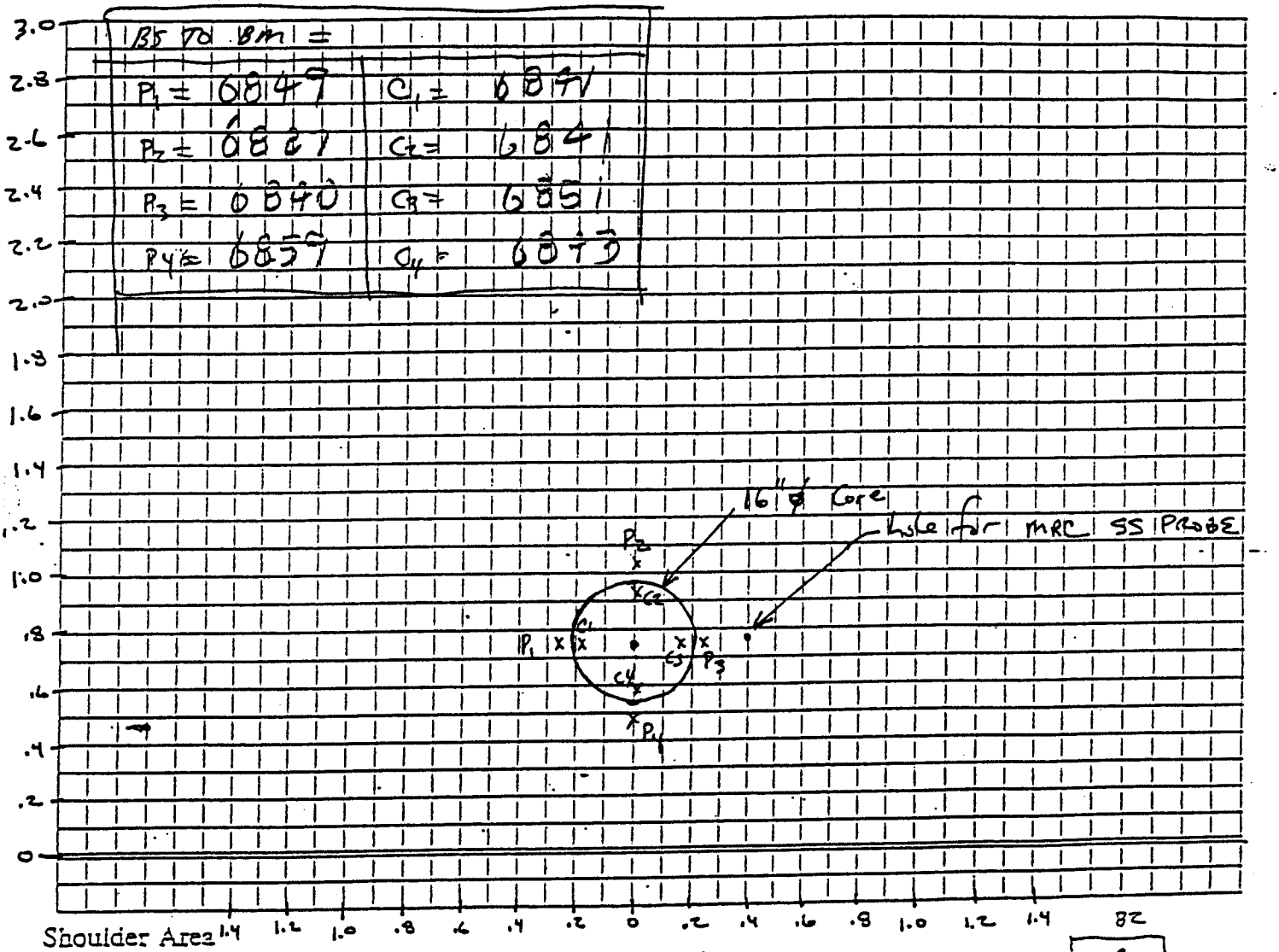
Date: (ddmmmyy) 11/Aug/95

31 S B 75 U

LTPP Seasonal Monitoring Program Data Sheet SMP-M1 (Page 1) Distress Survey of Instrumentation Area	Agency Code [31] SHRP Section ID [3018] Survey Date [11 AUG 95]

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: FAULTMETER See Survey data above

Location	Settlement, mm: Location 1	Location 2	Location 3	Location 4
Instrumentation block/hole	±	±	±	±
Trench	±	±	n/a	n/a

± with trench centered on block, take reading on each side of trench and average.

Entered · TW

5 L S B 9 5 0

LTPP Seasonal Monitoring Program Data Sheet SMP-D03 Contact Resistance Measurements	Agency Code [31] LTPP Section ID [3018]

Start Time (military): 0910

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	milli	309.4	micro	4.0	
2	2	3		308.1		4.2	
3	3	4		310.7		5.9	
4	4	5		290.3		9.2	
5	5	6		271.1		13.0	
6	6	7		239.6		16.4	
7	7	8		258.6		4.0	
8	8	9		310.3		2.3	
9	9	10		308.1		2.9	
10	10	11		305.6		3.1	
11	11	12		302.0		3.4	
12	12	13		292.7		4.3	
13	13	14		242.6		11.5	
14	14	15		81.6		3.5	
15	15	16		271.3		5.9	
16	16	17		262.3		11.2	
17	17	18		226.6		10.8	
18	18	19		229.2		13.8	
19	19	20		155.3		18.2	
20	20	21		155.6		10.2	
21	21	22		214.2		15.6	
22	22	23		127.6		16.8	
23	23	24		156.8		15.8	
24	24	25		173.2		13.8	
25	25	26		187.9		10.8	
26	26	27		237.6		6.6	
27	27	28		249.8		7.0	
28	28	29		241.3		9.6	
29	29	30		234.8		8.8	
30	30	31		241.8		6.9	
31	31	32		253.5		10.1	
32	32	33		161.5		20.7	
33	33	34		142.6		18.0	
34	34	35		162.3		12.4	
35	35	36		236.2		2.7	
36	36	37		0.6		271.3	R1 =
37	37	38		25.2		249.3	R2 =
38	38	39		137.9		137.6	R3 =
39	39	00		908.5		0.4	R4 =

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

Comments: _____

Prepared by: Robert Van Sambeek Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 11 / AUG / 95

outside lane 3 L S B 9 5 B

LTPP Seasonal Monitoring Program Data Sheet SMP-D04 Four-Point Resistivity Measurements	Agency Code [3 L] LTPP Section ID [3 0 1 8]

Start Time (military): 0920

Test Position	Switch Settings I1	V1	V2	I2	Voltage (ACV) Range Setting	Reading (Volts)	Current (ACA) Range Setting	Reading (Amps)	Comments
1	1	2	3	4	milli	17.2	micro	1.1	
2	2	3	4	5		23.6		1.5	
3	3	4	5	6		18.4		1.7	
4	4	5	6	7		19.4		2.9	
5	5	6	7	8		13.2		1.2	
6	6	7	8	9		21.3		1.5	
7	7	8	9	10		17.6		1.0	
8	8	9	10	11		11.0		0.4	
9	9	10	11	12		12.5		0.4	
10	10	11	12	13		13.3		0.8	
11	11	12	13	14		12.0		1.4	
12	12	13	14	15		4.7		1.1	
13	13	14	15	16		7.5		2.0	
14	14	15	16	17		6.5		1.1	
15	15	16	17	18		11.4		1.5	
16	16	17	18	19		14.3		3.1	
17	17	18	19	20		13.1		4.4	
18	18	19	20	21		8.3		2.9	
19	19	20	21	22		10.1		8.8	
20	20	21	22	23		7.1		5.6	
21	21	22	23	24		8.8		3.8	
22	22	23	24	25		9.3		5.8	
23	23	24	25	26		8.8		3.6	
24	24	25	26	27		8.0		3.4	
25	25	26	27	28		11.1		3.4	
26	26	27	28	29		8.3		2.3	
27	27	28	29	30		8.4		1.9	
28	28	29	30	31		11.5		1.9	
29	29	30	31	32		10.7		4.0	
30	30	31	32	33		10.0		4.6	
31	31	32	33	34		6.4		3.8	
32	32	33	34	35		9.1		6.0	
33	33	34	35	36		4.8		2.1	
36	36	36	37	37		0.5		271.8	R1 =
37	37	37	38	38		25.3		249.8	R2 =
38	38	38	39	39		138.2		137.9	R3 =
39	39	39	00	00		309.1		0.4	R4 =

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

Comments: _____

Prepared by: Robert Van Smoor Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 11 / AUG / 95

Entered: 4/10

31 SB95 B

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

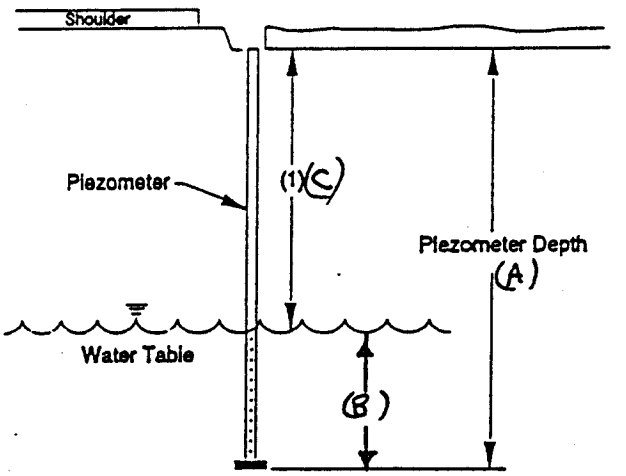
LTPP Seasonal Monitoring Program Data Sheet SMP-D05 Ground Water Table Measurement	Agency Code [31] LTPP Section ID [3018]

Piezometer Depth (m): (A) 4.760

Measurement Number	Time (military)	(C) Calculated (A−B) Depth to Water[1,2] (m)	(B) Measure Depth of Water (m)	Comments
1	0939	3.11	1.648	
2	____	__.__	__.____	

[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.



Comments: PVC piezometer installed — Screw off cap.

Prepared by: B Perkey Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 11 / Aug / 95

3 1 S B 9 5 B

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-D06 Joint Opening Measurement	Agency Code [31] LTPP Section ID [30 18]

Station	Time (military)	Joint Opening (mm) Offset (PE): ___.___ m	Offset (ML): ___.___ m	Offset (ILE): ___.___ m	Joint Width (mm)	
-30	0808				~~41.~~ 10.42	41
	1030				~~39.~~ 9.92	39
-12	0810				~~39.~~ 9.92	
	1031				~~39.~~ 9.92	39
0+5	0811				~~44.~~ 11.36	44
	1032				~~42.~~ 10.83	42
0+18	0813				~~48.~~ 12.21	48
					~~45.~~	45
	1033				11.55	
0+32	0814				~~40.~~ 10.29	40
	1035				9.73.	39
0+50	0817				~~44.~~ 11.20	44
	1057				10.64	42

31SB95B

Comments: No drill guide to install snaprings yet.

Prepared by: Brad Van Sumeren Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 11 / Aug 6 / 95

31 SB95B

LTPP Seasonal Monitoring Program Data Sheet SMP-D07 Joint Faulting Measurement	Agency Code [31] LTPP Section ID [3018]

Station	Time (military)	Joint Faulting (mm)		
		Offset (OWP): _ . _ _ m	Offset (ML): _ . _ _ m	Offset (IWP): _ . _ _ m
_ _ _ _ _	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
_ _ _ _ _	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
_ _ _ _ _	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
_ _ _ _ _	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
_ _ _ _ _	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
_ _ _ _ _	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _
	_ _ _ _	_ _ _ . _	_ _ _ . _	_ _ _ . _

"See 31SB95C"

Comments: No fault meter - @ FHWA for repair

Prepared by: Robert Van Sambeek Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 11 / AUG / 95

Entered: AP

31 SB 955

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-D09 Elevation Measurements - PCC	Agency Code [31] LTPP Section ID [3018]

Type of Instrument: NA 2000

Start Time (military): 0900

check "close" at midpoint of survey. 1' min 1' 2½

BM	Station	BS	HI	~~IPS~~ *	FS	ELEV	CLOSE
Piez.	0+11	.8697		2.6189			
D.O.T. BM Other	0+31	2.6190					2.6191

Station	Offset (PE): 0.3 m	Offset (ML): 1.83 m	Offset (ILE): 3.35 m	Comments
0-31	.6905	.6753	.6581	~~BS~~ AS
-0-22	.6869	.6733	.6573	~~BS~~ MP
0-13	.6813	.6664	.6492	MP BS
0-13	.6830	.6678	.6509	AS
0-4	.6802	.6646	.6484	MP
0+4.2	.6745	.6597	.6441	BS
0+04	.6791	.6625	.6469	AS
0+11	.6805	.6649	.6487	MP
0+17.3	.6760	.6616	.6456	BS
0+17	.6785	.6634	.6466	AS
0+24	.6737	.6606	.6443	MP
0+31.2	✓ .6677	.6540	.6369	BS
0+31	✓ .6700	.6547	.6375	AS
0+40	.6702	.6544	.6373	MP
0+49.2	.6612	.6476	.6313	BS

Comments: PIEZ. IS PVC W/O GREASE SLEEVE FOR FROST ACTION. TREAT ONLY AS SECOND BM.

Prepared by: _____ Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 11/Aug/95

3 1 S B 9 5 C

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-D10 SMP Field Activity Report	Agency Code [31] LTPP Section ID [3018]

Onsite Datalogger and Instrumentation		
File Name - *.ONS	315895CI	Comments: —
Battery Replace	Yes - (No)	Voltages 12.4
Repairs/Calib.	Sealed terminal strip w/ wax spray	
Other: —	—	

Mobile Datalogger		
File Name - *.MOB	315895CI	Comments: May want to adjust cable length
TDR/Resistance Voltages	Sets (02)	2nd Voltages all -6999 (plug not connected)
Other:		

Manual Data Collection		
Piezometer	(Yes) - No	Comments: 3.412m
Resistance 2 pt.	Sets (01)	Need to clean switches
Resistivity 4 pt.	Sets (01)	" " " "
Elevations	Sets (01)	DOT BM IS PRIMARY
Distress Survey	Yes - (No)	—
Long. Dipstick Profile	Yes - (No)	—
Photos or Video	Yes - (No)	—
Other:		—

FWD and Associated Data		
FWD Testing	Sets (02)	Operator: Jerome : Dicks
JCP - Snap Rings	Sets (02)	INSTALLED SNAP RINGS
JCP - Faulting	Sets (02)	* Check polarity
Other:		

IF REQUIRED, ATTACH SKETCHES TO THIS DATA SHEET

Comments: Faultmeter needs to be checked. When should the reading be a negative number?

Prepared by: Jerome Dicks / RSV Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 19/SEP/95 Daylight Savings Time (Y or (N)): N

3 1 5 B 9 5 C

LTPP Seasonal Monitoring Program Data Sheet SMP-M1 (Page 2) Distress Survey of Instrumentation Area	Agency Code [31] SHRP Section ID [3018] Survey Date [19 15EP 1995]

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: _____

Additional Comments short crack in epoxy (see fig.)

PLEASE REMEMBER TO ATTACH COLOR PHOTOGRAPH(S) OF INSTRUMENTATION AREA TO THIS DATA SHEET.

Prepared by: Robert Van Sanden Employer: BRAUN INTERTEC Corp.

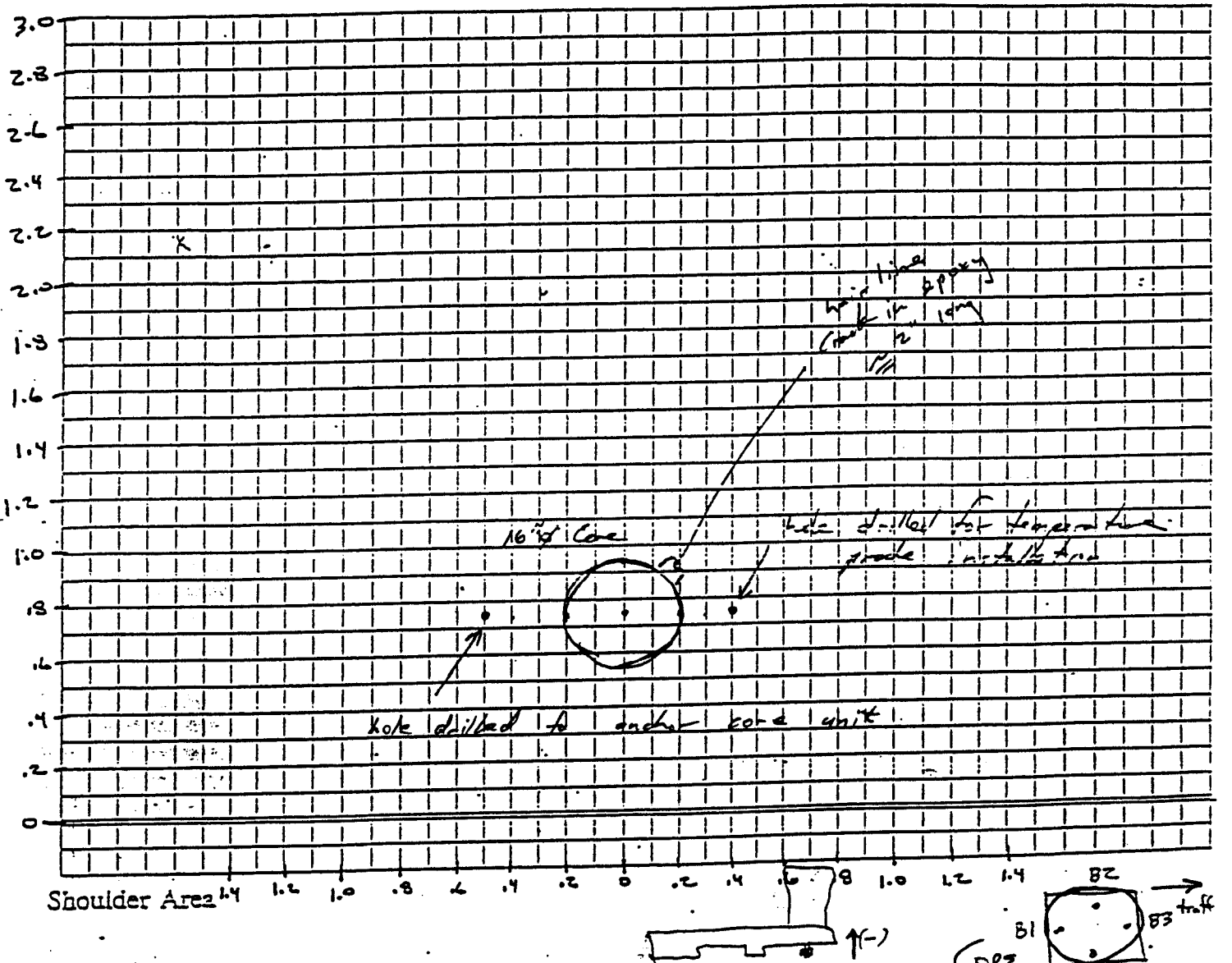
Date: (ddmmmyy) 19/SEP/95

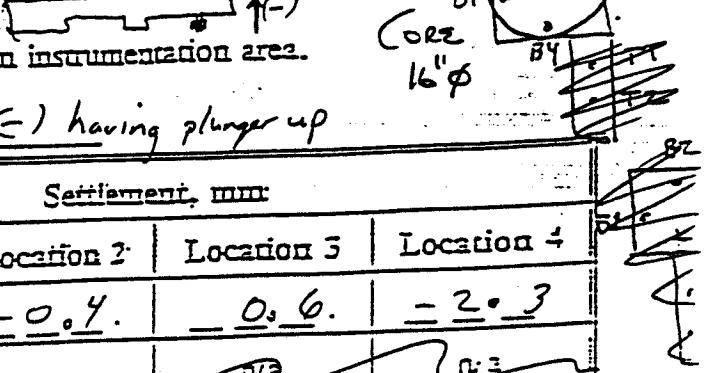
3 1 S B 9 5 C

LTPP Seasonal Monitoring Program Data Sheet SMP-M1 (Page 1) Distress Survey of Instrumentation Area	Agency Code [31] SHRP Section ID [3018] Survey Date [19 SEP 95]

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: FAULTMETER w/ (-) having plunger up

Location	Settlement, mm:			
	Location 1	Location 2	Location 3	Location 4
Instrumentation block/hole	-1.0	-0.4	0.6	-2.3
Trench	-1.0	-0.3	n/a	n/a

LTPP Seasonal Monitoring Program Data Sheet SMP-D06 Joint Opening Measurement	Agency Code [31] LTPP Section ID [3018]

Station	Time (military)	Joint Opening (mm) Offset (PE): 5.30 m	Offset (ML): 1.83 m	Offset (ILE): 3.35 m	Joint Width (mm)	
-31	1125	116.36	117.49	115.87		
	1125 1126	116.33	117.53	115.93	11.	43
	1127	116.36	117.52	115.86		
	1405	116.20	117.46	115.85	11.	42
		____.___	____.___	____.___	___.	
-13	1130	116.04	115.62	115.56		
	1130 1131	116.10	115.63	115.55	11.	43
	1132	116.04	115.62	115.58		
	1407	115.97	115.53	115.46	10.	39
		____.___	____.___	____.___	___.	
-4	1145	115.60	115.29	115.63		
	1145 1146	115.62	115.28	115.57	11.	43
	1147	115.58	115.29	115.50		
	1420	115.58	115.25	115.43	11~~0~~.	~~40~~
		____.___	____.___	____.___	___.	
-17	1206	115.37	115.74	115.81		
	1200 1201	115.39	115.80	115.82	10.	41
	1202	115.40	115.82	115.78		
	1425	115.36	115.77	115.77	10.	40
		____.___	____.___	____.___	___.	
-31	1210	116.06	115.97	115.26		
	1210 1211	116.24	116.04	115.26	10.	39
	1212	116.14	116.02	115.26		
	1430	116.03	115.97	115.16	10.	41
		____.___	____.___	____.___	___.	
-49	1220	115.90	115.55	116.32		
	1220 1221	115.93	115.53	116.32	11.	44
	1222	115.95	115.52	116.37		
	1445	115.98	115.57	116.27	11.	44
		____.___	____.___	____.___	___.	

Comments: INSTALLED RINGS TODAY

Prepared by: Jerome Dicks Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 19/Sep/95

Note: Faultmeter polarity was wrong. All readings should be entered as (+) values. AV 31SB95C

Entered: 9/11

Seasonal Monitoring Program Guidelines: Version 2.1a/March 1995

LTPP Seasonal Monitoring Program Data Sheet SMP-D07 Joint Faulting Measurement	Agency Code [31] LTPP Section ID [3018]

Station	Time (military)	Joint Faulting (mm) Offset (OWP): 0.76 m	Offset (ML): 1.83 m	Offset (IWP): 2.90 m
0-31	1135	~~-2.9 -4.6~~	-1.8	-1.5
	1410	-2.9	-2.0	-1.3
		____.__	____.__	____.__
0-13	1138	~~-1.0 -2.0~~	-2.3	~~-3.6 -2.0~~
	1412	-1.1	-2.6	-3.3
		____.__	____.__	____.__
0+04	1150	-4.8	-4.0	-2.9
	1425	-4.4	-3.9	-3.0
		____.__	____.__	____.__
0+17	1205	~~-2.8~~	-2.5	-2.0
	1427	-2.9	-2.6	-2.3
		____.__	____.__	____.__
0+31	1215	-2.0	-1.0	-2.1
	1440	-2.1	-1.1	-2.5
		____.__	____.__	____.__
0+49	1220	-4.2	-2.8	-2.4
	1456	-4.5	-2.4	-3.1
		____.__	____.__	____.__

Comments: Note: This is how a joint with a negative fault looked like. → Traffic

Prepared by: Jerome Dicks Employer: Braun Intertec Corporation

Date (dd/mmm/yy): 19Sep95

Appendix D-2: Routine SMP Monitoring Data Collection Summary

Appendix D-2 contains the following information:

- Standard LTPP SMP data tracking log;
- Field testing information sheet; and
- Screen prints and photographs documenting equipment problems.

31SB - 313018, I-80 WB LANES, 1.0 MILE EAST OF KEARNEY, NE. (MP 274.5)

Date		ONSITE Data			MOBILE Data		Manual Data								FWD Data				Distress		Profile		Comments
dd/mmm/yy (ctrl+shft+d)	Visit ID	Pvmt. Temp.	Air Temp.	Rain	TDR	Frost Volts	Backup Temp	Backup TDR	Frost 2-Pt.	Frost 4-Pt.	Water Table	Pvmt. Elev.	Joint Open.	Joint Fault	Man. Temp.	No. of Cycles/Visit OWP	ML	PE	M	P	P	D	
?????																				X			
?????																					X		
22-Aug-94																					X		
19-Apr-95															X	1	1	1	X				DISTRESS SURVEY PRIOR TO INSTALLATION.
10-Aug-95	95A														X	1	1	1					INSTALLATION.
11-Aug-95	95B	X	X	X	X	X			X	X	X	X			X	2	2	2					
19-Sep-95	95C	X	X	X	X	X			X	X	X	X	X	X	X	2	2	2					
16-Oct-95	95D	X	X	X	X	X			X	X	X	X	X		X	3	3	3					
29-Oct-95																					X		
14-Nov-95	95E	X	X	X	X	X			X	X	X	X	X	X	X	3	3	3					SET ONSITE CLOCK FOR STANDARD TIME.
13-Dec-95	95F	X	X	X	X	X					X					0	0	0					NO TESTING DUE TO BAD WEATHER.
22-Jan-96	96A	X	X	X	X	X			X	X	X					0	0	0					NO TRAFFIC CONTROL. REPLACED RELAY FOR CR10.

G:\LTPP\SMP\QPRO\SMPLOGNW.WB2

313018 - 31SB

Updated 31-Oct-95

LOCATION - IH-80 WB Lanes, 1.0? Miles East of Kearney, NE (MP 274.5)
CONTACTS - William Bebb (308)-865-5430 (Second contact is Bill Parrish (308)-385-6265)
TEMP HOLES - Sta 0-03?, Depths about 1.0?", 6.0?", and 11.0?" (PCC = 11.9").

TEST LOCATIONS:	J1	J2	J3	J4	J5
	-22	-29	BLK	-31	-30
	-04	-11	-03	-13	-12
	11	6	12	4	5
	24	19	25	17	18
	40	33	41	31	32
	---	---	---	49	50

DISTRESS COMMENTS:

Sta J1 - Midpanel tests.

-22 LP ADJACENT TO INSTRUMENTATION HOLE

Sta J2 and J3 - Corner and Mid-edge tests.

Sta J4 and J5 - Load transfer tests in the OWP.

PIEZOMETER - Sta 0+11, 1.0? feet from edge of paved shoulder, Depth = 4.766M.
(Located longitudinally at midpanel of third panel tested.)

ELEVATIONS - DOT BM at sta. 0+31 and 68 feet from edge stripe (1.0' in from fence)
Note: Piezometer is not anchored, but is still used as second reference for elevation surveys.

Offsets:	PE	ML	ILE
(M)	0.30	1.83	3.35
(ft)	1.0	6.0	11.0
	(hole)	(hole)	(hole)

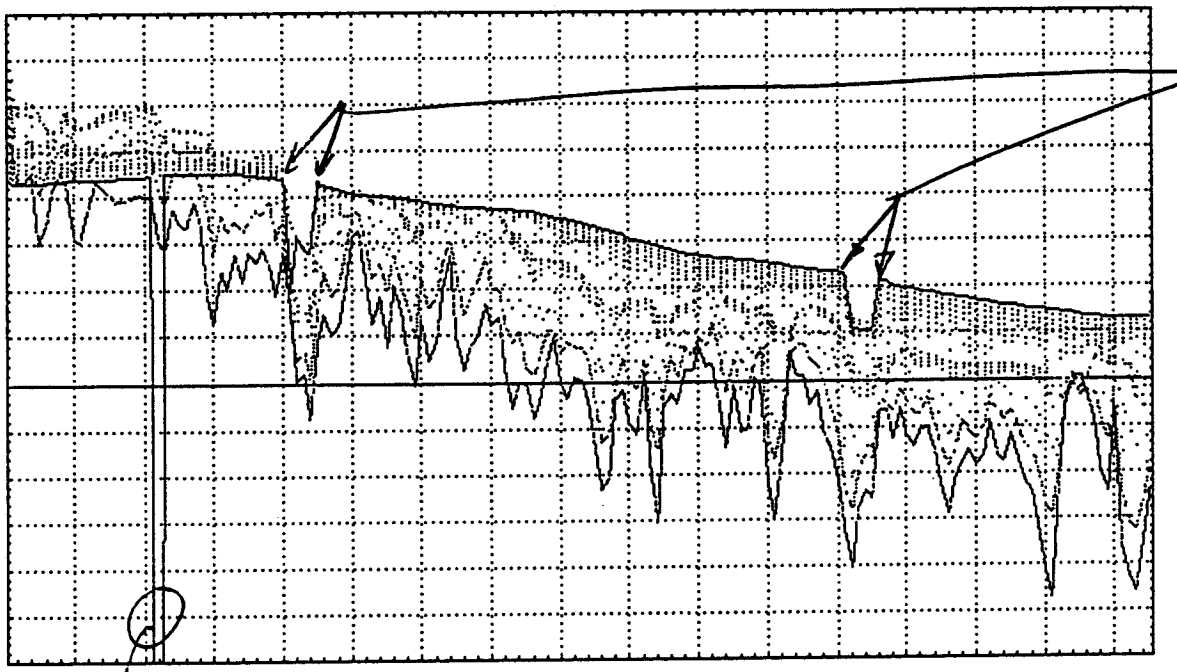
Sta: - BJ/AJ -31 -13 4 17 31 49
- MP -22 -4 11 24 40
(Only AJ at -31 and BJ at 49)

FAULTMETER	Offsets:	OWP	ML	IWP
	(M)	0.76	1.83	2.90
	(ft)	2.5	6.0	9.5

Sta: -31 -13 4 17 31 49

COMMENTS -

Record Type 4 - Daily Minimum Air & 18 MRC Sensor Temperatures
State: Nebraska Site: B



222 (10/08/95) Day Number (21/01/96) 21
Legend: Min. Air Temperature — First MRC Sensor Temperature —

MRC Sensor: 18

Esc=Exit: ↑↓=Sensor: F8,F9=Edit Ln: F2=PrntScrn: Ctrl+F10=Perf. Edit

RELAY FAIL

EXPECT ALL MRC #6 TO #18 BAD.

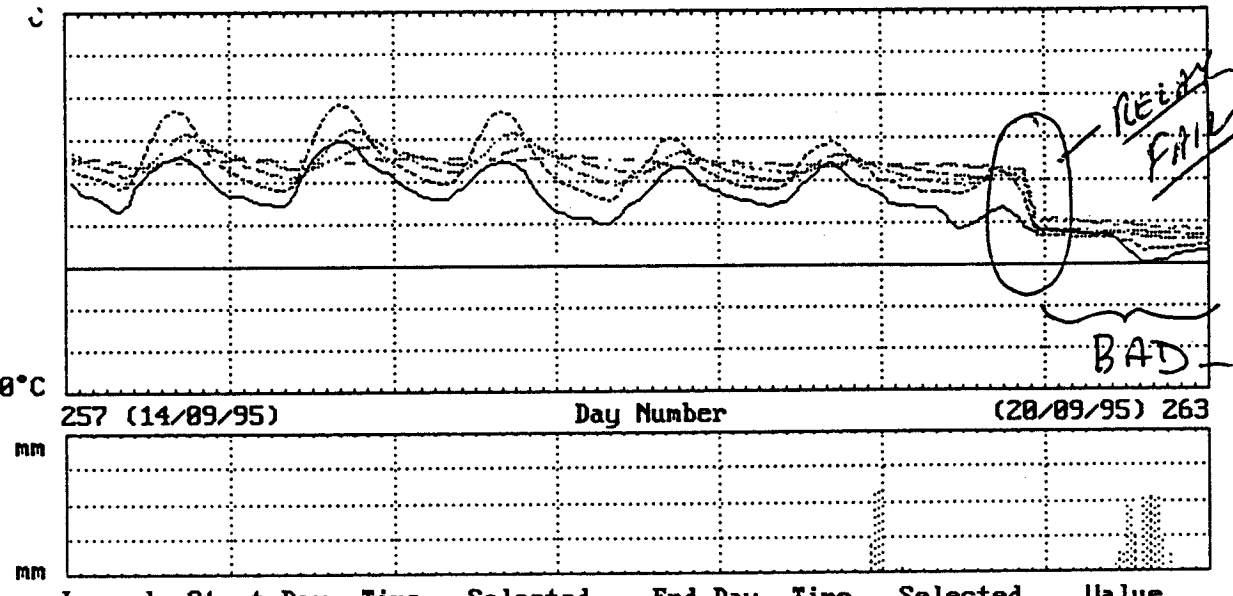
- FOR MRC #1 TO #5 WILL HAVE TO EDIT HOUR BY HOUR

MRC #18 @ -225.90 ONE DAY

- NULL OUT -

- BEST METHOD TO I.D. RELAY FAILURE IS TO LOOK AT MRC #18 IN EDIT MODE FOR DAILY MINIMUM

Record Type 5 & 6 - Hourly Air & First 5 MRC Sensor Temperatures
State: Nebraska Site: B



Legend	Start	Day	Time	Selected	End	Day	Time	Selected	Value
AirT	0	257	100		0	264	000		
MRC1	1	257	100		1	264	000		
MRC2	2	257	100		2	264	000		
MRC3	3	257	100		3	264	000		
MRC4	4	257	100		4	264	000		
MRC5	5	257	100		5	264	000		
[illegible]	6	257	100		6	264	000		

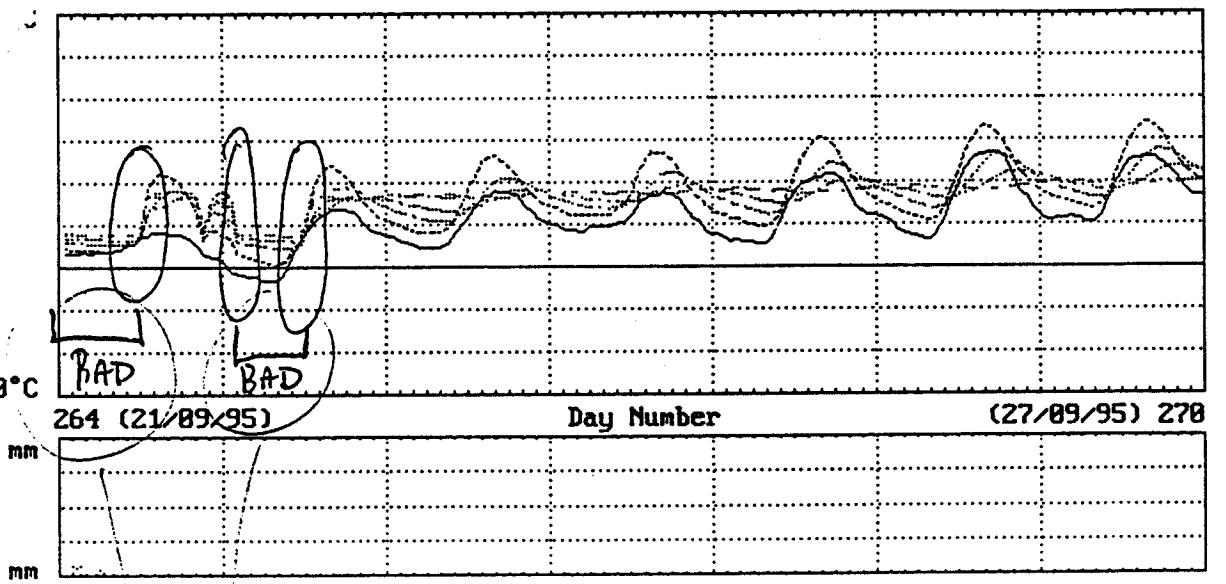
Menu: PgUp.PgDn=Prior/Next Week: F8.F9=Edit: Ctrl+F10=Remove: F2=PrintScreen

ALL 18 MRC
- HIGH
- LOW
- AVERAGE

FOR MRC #1 to #5 WILL HAVE TO EDIT HOUR BY HOUR

SEE SHEET 5 FOR DAYS 257 to 347
95 95

Record Type 5 & 6 - Hourly Air & First 5 MRC Sensor Temperatures
State: Nebraska Site: B

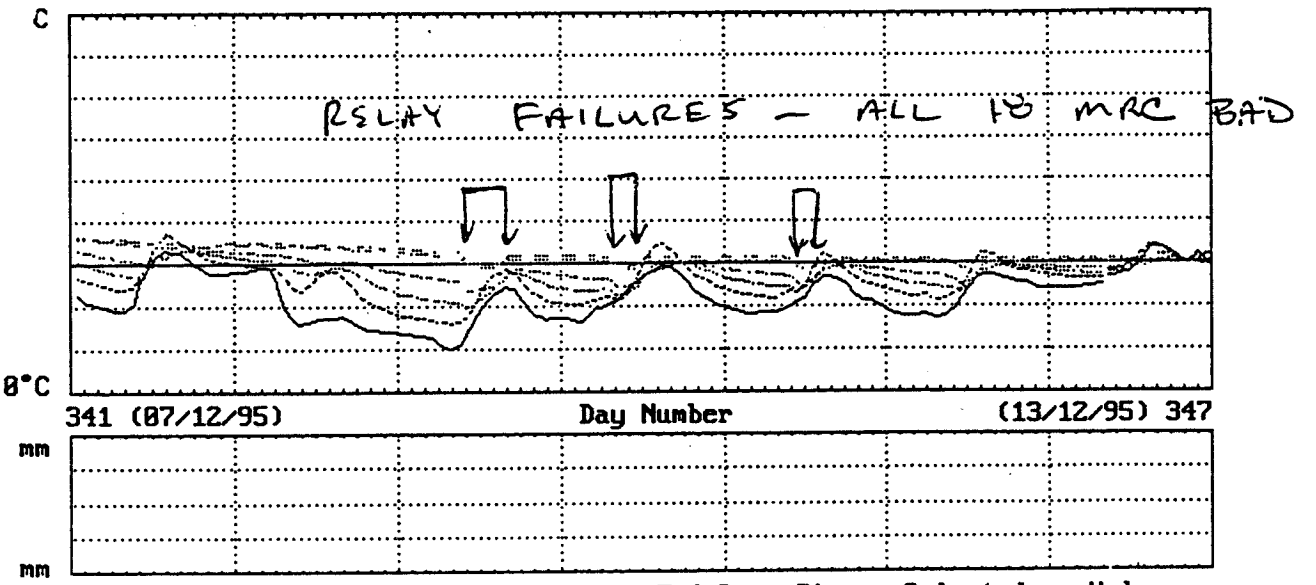


Legend	Start	Day	Time	Selected	End	Day	Time	Selected	Value
AirT	0	264	100		0	271	000		
MRC1	1	264	100		1	271	000		
MRC2	2	264	100		2	271	000		
MRC3	3	264	100		3	271	000		
MRC4	4	264	100		4	271	000		
MRC5	5	264	100		5	271	000		
[illegible]	6	264	100		6	271	000		

Menu: PgUp,PgDn=Prior/Next Week; F8,F9=Edit; Ctrl+F10=Remove; F2=PrintScreen

MRC #1 to #5 BAD

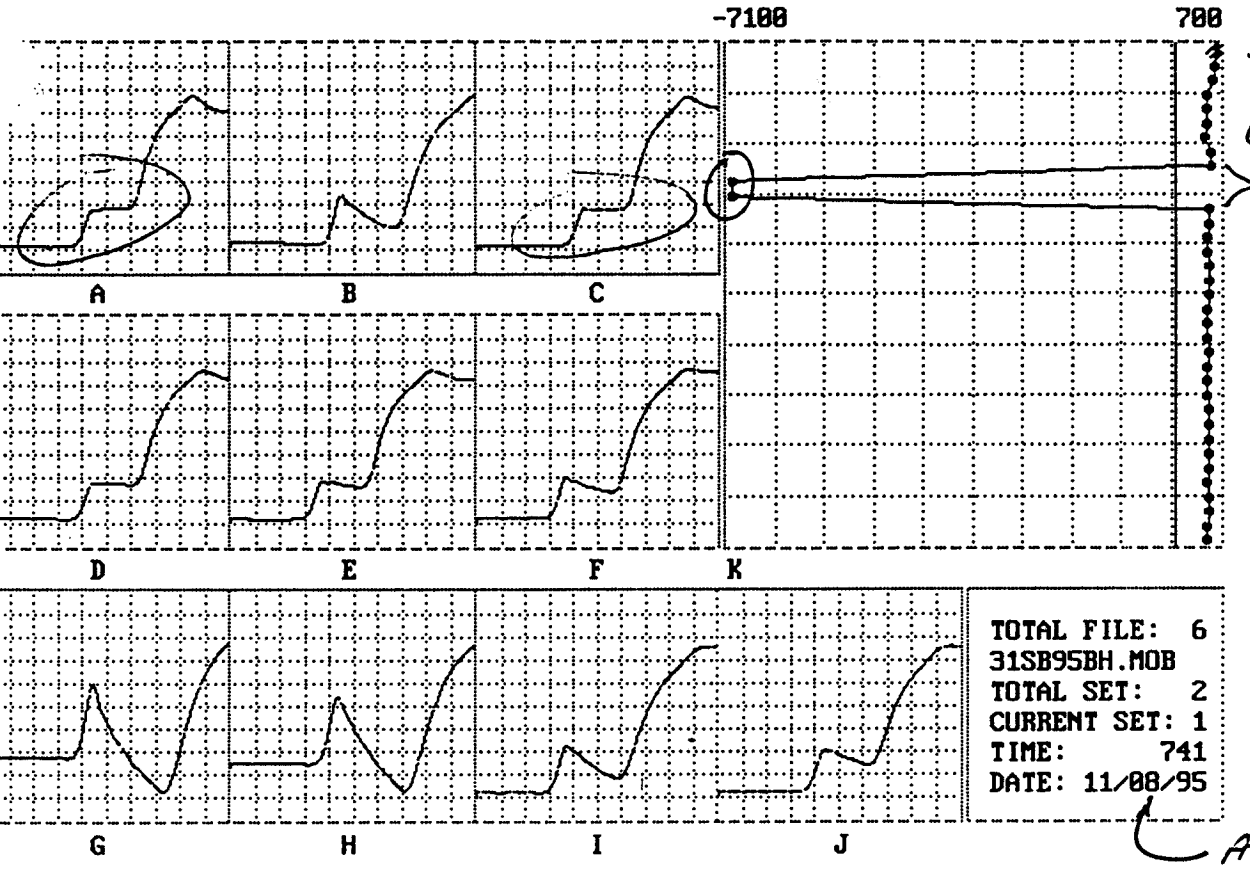
Record Type 5 & 6 - Hourly Air & First 5 MRC Sensor Temperatures
State: Nebraska Site: B



Legend	Start	Day	Time	Selected	End	Day	Time	Selected	Value
AirT	0	341	100		0	348	000		
MRC1	1	341	100		1	348	000		
MRC2	2	341	100		2	348	000		
MRC3	3	341	100		3	348	000		
MRC4	4	341	100		4	348	000		
MRC5	5	341	100		5	348	000		
[illegible]	6	341	100		6	348	000		

Menu: PgUp.PgDn=Prior/Next Week; F8.F9=Edit; Ctrl+F10=Remove; F2=PrintScreen

RELAY REPLACED IN JANUARY 1996



POSITION 10/11
CRREL PROBLEM
ASSIGN -6999 to -1

F

AUG. - DAY

er=Curve to select (*): PgU/PgD=Prior/Next set: Ctrl+PgU/PgD=Prior/Next File

AFTER INSTALL

NO FROST

FHWA/TAC ADVISE TDR #1, #3, #4

— SLOPE STAYS POSITIVE

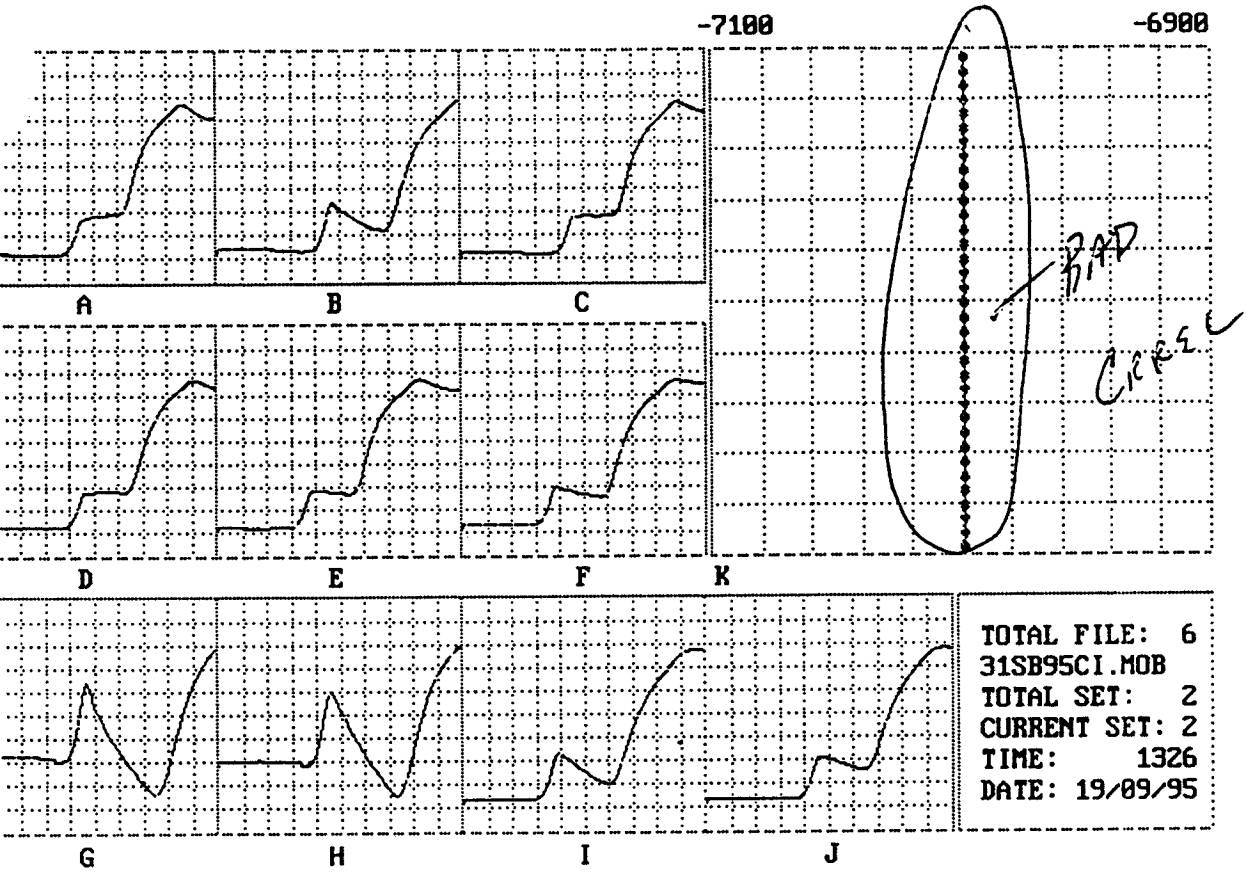
— ARE TRACES GOOD/BAD?

— VERY COARSE MATERIAL

— PRODUCING SHORT LA

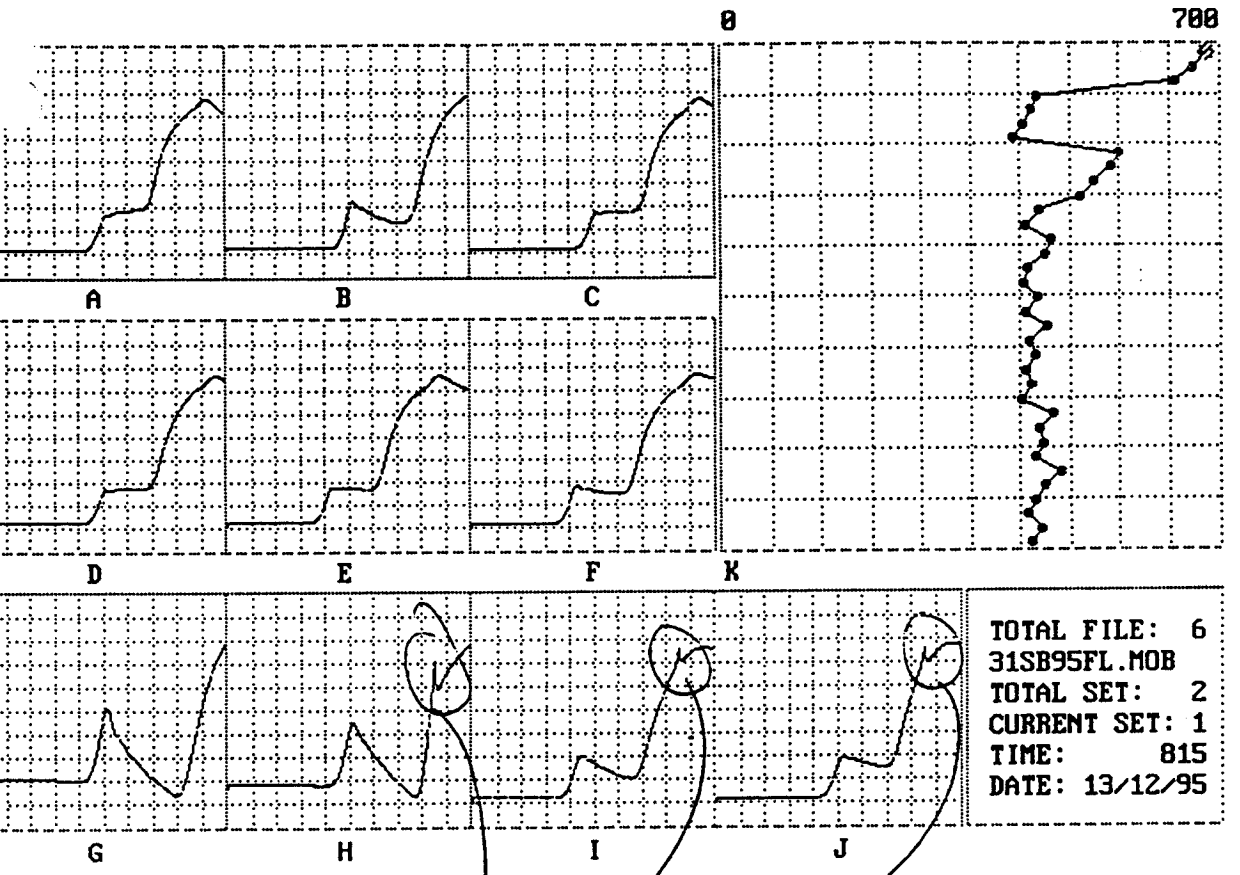
FROM LOW MOISTURE

LIMIT FOR MATL.



FAILURE ?

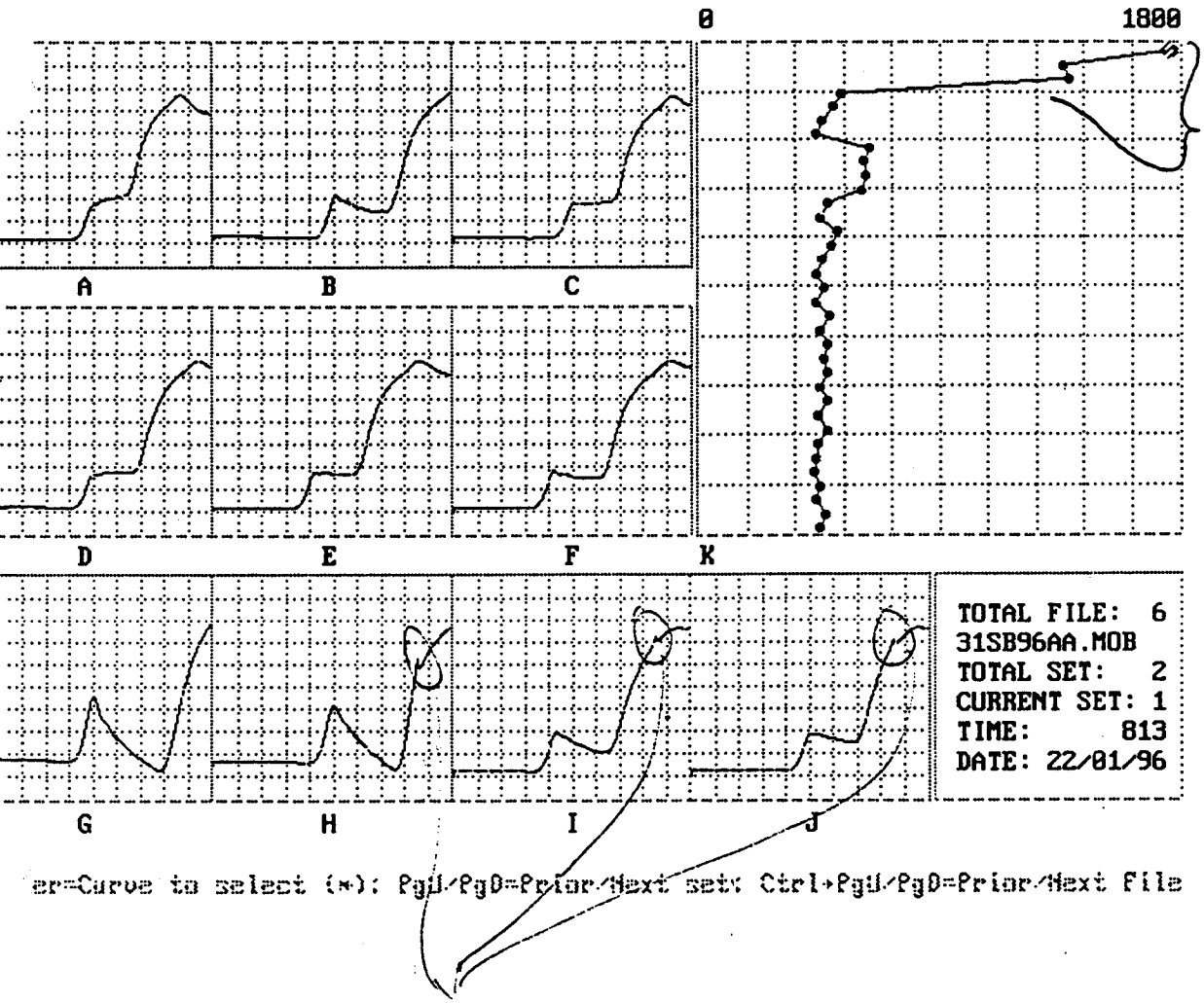
er=Curve to select (*); PgU/PgD=Prior/Next set; Ctrl+PgU/PgD=Prior/Next File



er=Curve to select (↑↓): PgU/PgD=Prior/Next set: Ctrl-PgU/PgD=Prior/Next File

} Some MRC's BELOW OC
— COULD HAVE FROST?
— SEE SET 31SB96A

SPIKES FROM COLD CABLE READER



MRC #4 AND #5
LESS THAN 0°C

FROST

SPIKES FROM COLD CABLE READER