

**SPS-1 Construction Report
U.S. Highway 81, Southbound
80 Miles Southwest of Lincoln, Nebraska
(4 Miles) North of the Kansas Border**

Sections 310113 to 310124

**Federal Highway Administration
LTPP Division
North Central Region**

Report Prepared By:

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6875 Washington Avenue South
P.O. Box 39108
Minneapolis, Minnesota 55439-0108**

June 24, 1996

BRAUNSM
INTERTEC

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*Engineers and Scientists Serving
the Built and Natural Environments®*

June 24, 1996

Mr. Richard C. Ingberg
Regional Engineer
Braun Intertec Corporation
6875 Washington Avenue South
P.O. Box 39108
Minneapolis, MN 55439-0108

Dear Mr. Ingberg:

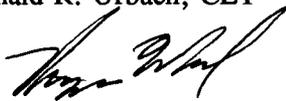
Enclosed is the Construction Report for the Nebraska SPS-1 project.

If you have any questions about this report please call Ronald Urbach or Benjamin Worel.

Sincerely,



Ronald R. Urbach, CET



Benjamin J. Worel, PE

Attachment:
Report

c: Mr. Monte Symons, FHWA
Mr. John Miller, PCS/Law
Mr. Cameron Kruse, Braun Intertec

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1.0 Introduction

The SPS-1 experiment is a study of relative strategic factors that influence the performance of flexible pavements. The factors addressed in this study include:

- Drainage;
- Base type (dense-graded aggregate base, dense-graded asphalt treated base and permeable asphalt treated base); and
- Asphalt pavement thickness.

1.1 Experimental Cell

This experiment is in the dry-freeze environmental zone. The subgrade soils are classified as fine-grained. The test sections for this project are placed in the "K" cell.

1.2 Summary of Supplemental Test Sections

There are no supplemental test sections associated with this SPS-1 project. It should be noted that the SPS-9A project is located just south of this project.

1.3 Project Location

This SPS-1 project is located in southeast Nebraska on US Highway 81 southbound, about 55 miles south of York, Nebraska, or about 80 miles southwest of Lincoln, Nebraska. Attachment A shows the SPS-1 project location along with the other Nebraska GPS and SPS sites. Attachment B shows the project location on the Thayer County map.

1.4 Type of Roadway

This project consists of new construction of a realignment west of the original US 81 roadway and will eventually be used for the southbound two-lane traffic for US 81. The grading was completed in 1994. The realignment will provide two-way traffic in both north and south directions until the existing roadway is reconstructed in 1996. Attachment C shows the test section layout.

1.5 Traffic Characteristics

The following traffic characteristics exist for the project as reported by Nebraska.

Annual average daily traffic (two directions):	4,725
Percent heavy trucks and combinations (of AADT):	26 percent
Estimated 18-kip ESAL rate and study lane (ESALs/year):	119,000
Total design 18-kip ESAL applications in design lane:	2,400,000
Design period (years):	20

1.6 Known Deviations From Guidelines

The following are the major deviations that were encountered during the construction of this project. Attachment D contains the project deviation report.

- Two-way traffic on the new roadway will use the roadway until the existing original road has been reconstructed in 1996.
- The control test section has been designated as 310901 and is also the control section for the SPS-9A project.
- The stone-matrix asphalt (SMA) pavement material was placed and extended into the last 75 feet (test section stationing 4+25 through 5+00) of the control test section. This section has been placed out of study in the database.
- Three of the test sections are located over culverts. Fill depths are greater than 10 feet.

1.7 Geometry

This roadway is relatively straight with maximum vertical grades of 1.1 percent.

1.8 Underground Structures Within Test Sections

The test sections were located to avoid shallow fills over culverts. Three of the test sections are located over culverts with fill depths greater than 10 feet.

1.9 Installation of Weather Station

The LTPP weather station will be installed in 1996 by the agency. The weigh station located about two miles north of the SPS-1 project. The foundations and the chainlink fence were installed by the agency in fall, 1995.

1.10 Installation of WIM

The weigh-in-motion (WIM) equipment was manufactured by International Road Dynamics. Their address is:

702 43 Street East
Saskatoon, Saskatchewan
Phone: (306) 934-6777

The WIM is a bending plate style Model 486SX. This equipment was installed by Kayten Electric from Hodrege, Nebraska. It was installed at project stationing 10663+00. This is about 5 miles north of the SPS-1 project. The traffic pattern at the WIM location should be representative of the SPS-1 project because there are no main highways or towns located between the WIM and the test sections.

1.11 Scheduling for Opening of Traffic

Traffic was placed on this SPS-1 project on August 15, 1995.

1.12 General Problems

There were several delays because of rain and equipment breakdowns. Most of the delays with the equipment breakdowns were due to problems with the CMI asphalt mix plant.

1.13 Resident Engineer Information

Mr. George Woolstrum
Nebraska Department of Roads
Special Project Engineer
1500 Nebraska Highway 2
P.O. Box 94759
Lincoln, Nebraska 68509-4759
Phone: (402) 479-4791
Fax: (402) 479-4325

Mr. William Cuda
Project Manger
Nebraska Department of Roads
R.R. 4, Box 86
York, Nebraska 68467
Phone: (402) 362-5934

Mr. Frank Doland
FHWA - Federal Building
100 Centennial Mall North
Lincoln, Nebraska 68508-3851
Phone: (402) 437-5521
Fax: (402) 437) 5146

1.14 Material Sampling and Testing

Mr. Donald Mazour, Soils and Aggregate Engineer
Mr. Mark Hassler, Materials Engineer
Nebraska Department of Roads
1500 Nebraska Highway 2
P.O. Box 94751
Lincoln, Nebraska 68507-4757
Phone: (402) 479-4791
Fax: (402) 479-4325

The field sampling and testing and data collection during construction was performed by:

Mr. Mike Harrison, CT3
Mr. Tom Anderson
Nebraska Department of Roads
R.R. 4, Box 86
York, Nebraska 68467
Phone: (402) 362-5934

1.15 Contractor Information

The work was performed by Constructors Incorporated.

Mr. David Branenhoff, Project Manager
Mr. Scott Gerrard, Project Manager
Mr. Abe Anshasi, Quality Control Manger
Mr. Ron Kutz, Grading Superintendent
Mr. Stephen Clancy, Asphalt Superintendent

Constructors Incorporated
P.O. Box 80268
Lincoln, Nebraska 68501
Phone: (402) 434-1764

1.16 Summary of Key Construction Equipment

The following equipment was used during construction.

Subgrade Preparation

- Bomag, Soil Conditioner
- Farm Style Disk
- Ingersoll-Rand Model SP100F Single Drum Stubnosed Sheepsfoot Compactor
- Caterpillar WP20 5 1/2-foot drum with 8-in. spikes, sheepsfoot compactor
- CMI Full Width Soil Profiler Model SP-30-ST
- Caterpillar 12-foot soil Profiler Model TR225B

Dense-Graded Aggregate Base (DGAB) Placement

- Cedar Rapids Model BSF520 Paver
- Motor Grader
- Ingersoll-Rand DA48 Double Drum Compactor
- CMI Full Width Soil Profiler Model SP-30-ST

Edge Drain Placement

- Vermeer Model T555 Trencher
- Small Vibrating Plate Compactor
- Tractor Backhoe

Asphalt Paving

- CMI Asphalt Drum Plant With a Capacity of 385 Tons Per Hour

Placement of Asphaltic Concrete Pavement

- Blaw Knox Model PF200 Rubber Tired Paver
- Cedar Rapids Model BSF520 Track Paver
- Blaw Knox Model PF500 Track Paver
- Breakdown Roller Double Drum Caterpillar CB534
- Intermediate Roller, Pneumatic-Tired Bomag BU12R
- Finish Roller Ingersoll Rand DA48 and a Hyster Model C350A
- Asphalt Distributor to place a tackcoat

2.0 Project Details

The materials sampling and testing plan, both pre- and post-construction, is shown in Attachment E. These plans are dated May 1, 1995.

2.1 Construction Activities

The following construction activities were performed during the construction of this project. Because of the layer thickness requirements, the contractor used a Stringline for thickness control.

Subgrade Preparation

As part of the project specifications, the upper 6 inches of the subgrade soils were reworked and compacted.

Prior to starting the subgrade preparation work, the contractor used a caterpillar 12-foot wide soil profiler to trim the subgrade approximately 1 to 2 inches above proposed grade. Some areas required additional fill soils.

A Bomag Soil Conditioner or a motor grader was used to loosen the existing subgrade soils. A farm-style disk was used to dry the soil, or if water needed to be added, to mix it for more uniform compaction. A Caterpillar WP20 Sheepsfoot Compactor was used to compact the soil. This compactor had a 5 1/2-foot drum with spikes approximately 8 inches in length. Also, a Ingersoll-Rand Model SP100F Stubnosed Sheepsfoot was also used for compaction. This had a 5-foot drum and spikes approximately 3 inches in length.

The soils were compacted until the feet of the sheepsfoot walked out of the compacted soils. After the soils had been replaced and compacted, the Caterpillar 12-foot wide profiler was used then again to trim the top of the subgrade elevations.

Dense-Graded Aggregate Base (DGAB) Placement

For ease of placement and thickness control for the DGAB, the contractor used a Cedar Rapids Model BSF520 Track Paver for placement. After the DGAB was placed, an Ingersoll-Rand

DA48 Twin Drum Compactor was used to compact the dense-graded aggregate base. Water was added to aid in compaction. Because of the coarse gradation, and even though the material was compacted properly, it moved underfoot.

Permeable Asphalt Treated Base (PATB) and Asphalt Treated Base (ATB)

The PATB and ATB were produced using the CMI drum asphalt plant. The PATB and ATB were placed using a Blaw Knox Model PF500 rubber-tired paver.

The PATB was placed in one lift. The PATB was compacted using an Ingersoll-Rand Model DA48 compactor. It was rolled using only static weight -- no vibration was used. The ATB was compacted using a caterpillar model CB534 dual-drum vibratory compactor, pneumatic-tired Bomag Model BW12R and Ingersoll-Rand Model DA-48 for the finish rolling.

Placement of the Edge Drains

A Vermeer Model T555 Trencher was used to prepare the trench for the edge drains. Depending on the grade that the pipe had to be placed, trenching depths vary. The trench was approximately 10 inches in width. A geotextile manufactured by Industrial Fabrics Inc., was placed in the bottom of the trench. Bricks were used in the bottom of the trenches to support the PVC pipe. The 4-inch PVC pipe that was used for the edge drains was in 10-foot sections. The pipe was manufactured by Contech and was style A2000 sewer pipe. The slots in the pipe were placed at approximately 10:00 and 2:00 o'clock locations. A crushed limestone rock, 1-inch diameter, clean type RC-1 was placed on top of the pipe. A small vibrating plate-type compactor was used to compact the backfill material in the trench.

Asphalt Concrete Plant

The asphalt concrete for the project was produced in a CMI Drum Plant that was rated at a capacity of 385 tons per hour. This plant was located so that the longest haul distance was about 2 miles.

Asphalt Paving

The asphalt concrete was placed with three different types of pavers: Blaw Knox Model PF200 rubber-tired; a Cedar Rapids Model BSF520 Track Paver; or a Blaw Knox Model PF500 8-Track Paver. After the asphalt concrete was placed, a Caterpillar Model CB534 dual-drum vibratory compactor was used for the breakdown passes. The intermediate rolling was done with a pneumatic-tired Bomag Model BW12R making several passes over the asphaltic concrete. The finishing of the asphaltic concrete surface was done with an Ingersoll-Rand DA 48 vibratory compactor or a Hyster Model C350A twin-drum vibratory compactor.

A tackcoat of CSS-2 emulsified asphalt was placed between each lift of asphalt mix. The CSS-2 emulsion was placed at a rate of 0.20 gallons per square yard.

2.2 General Construction Remarks

Mr. Mike Harrison and Mr. Tom Anderson from the Nebraska Department of Roads completed the data collection forms that were required for the project during construction.

The operation of the asphalt plant was monitored by Mr. Dennis Endorf and Mr. Greg Novotny, also with the Nebraska Department of Roads.

A wrap-up meeting was held in Lincoln, Nebraska, on January 25, 1996, with representatives of the agency, the contractor and LTPP. Below is a summary of what was discussed at that meeting.

- The project was delayed for several weeks because of the extremely wet spring and rain during construction.
- Constructors Incorporated, the general contractor, indicated that they were not familiar with what the project involved until after they have started the project. They indicated that a pre-bid meeting with a requirement to attend this meeting to be able to bid on the project would have helped.
- The project specifications indicated that the permeable asphalt treated base (PATB) could not have traffic on it after placement. This was somewhat modified after they found that they could not build a haul roads or have a side delivery paver on site. The agency allowed contractor travel on the non-test side of the permeable asphalt treated base to place the pavement on the monitoring side.
- After the dense-graded aggregate base (DGAB) was placed, construction traffic roughed and loosened up the material after it was placed. This required adding additional water and compacting it just ahead of the paving operation.
- The edge drains were considered over-designed because of the dry-freeze designation of the project. The edge drains were designed the same for all SPS-1 projects for uniformity. Mr. George Woolstrum indicated that he visited the project during late summer, 1995, and there was water coming out of some of the edge drain outlets.
- The contractor used a straightcut bulkhead for the areas where they stopped and started. It was felt that the straightedge would give a more uniform transition than a taper.
- The contractor indicated that there were ten different types of aggregates used on this project. All of the aggregates had to be trucked to the site and some were trucked over 120 miles.
- The contractor indicated there was little delay of the project due to the amount of sampling and testing.
- Because of the research nature of the test sections and layer thickness requirements, the operation would have worked out smoother if surveyors had been on-site full-time or the Nebraska Department of Road Survey Crew would have provided the staking. The project staking was done under contract with an independent surveying firm.
- The contractor's general overall rating of the project was a 1-3 out of 10. This was due to the very low productivity and the many surprises that were unforeseen during the bidding process. As indicated previously, a pre-bid meeting and/or a pre-construction meeting with the actual people doing the work in the field would have been a big help.

The Nebraska agency personnel gave a project rating of approximately eight (8). They indicated that the contractor did a relatively good job based upon the problems of constructability they had. They indicated that the staking had a very low rating as was previously indicated by the contractor. The agency personnel on-site indicated that they were surprised at the amount of paperwork and samplings that was required. In spite of all the problems the DOT representative indicated that the contractor did a relatively good job.

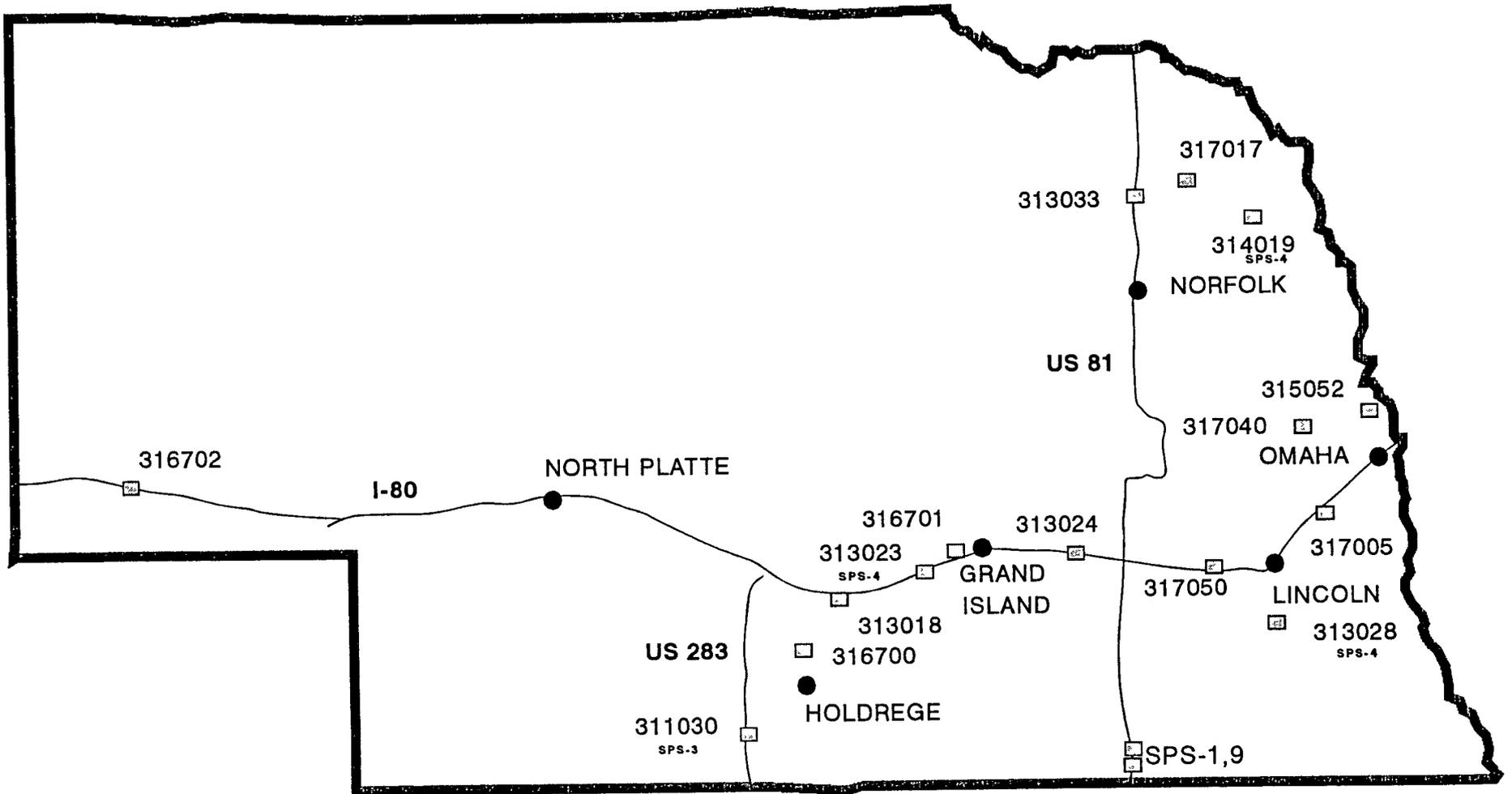
2.3 General Comments from the LTPP Representative

The project went fairly well with all of the problems because of the wet spring and the rains during construction. Recommendations to Mr. George Woolstrum appointed Mr. Don Mazour from the Materials Testing to coordinate the sampling and testing of the soils in the field. Mazour was also responsible for the coordination of the laboratory testing that is being performed by the Department of Roads. This coordination with Mazour worked very well. Mr. Mike Harrison did an excellent job with the data collection in the field.

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Attachment A
Nebraska Project Location Site Map

**SHRP-LTPP TEST SITE LOCATIONS
NEBRASKA
GENERAL PAVEMENT STUDIES**

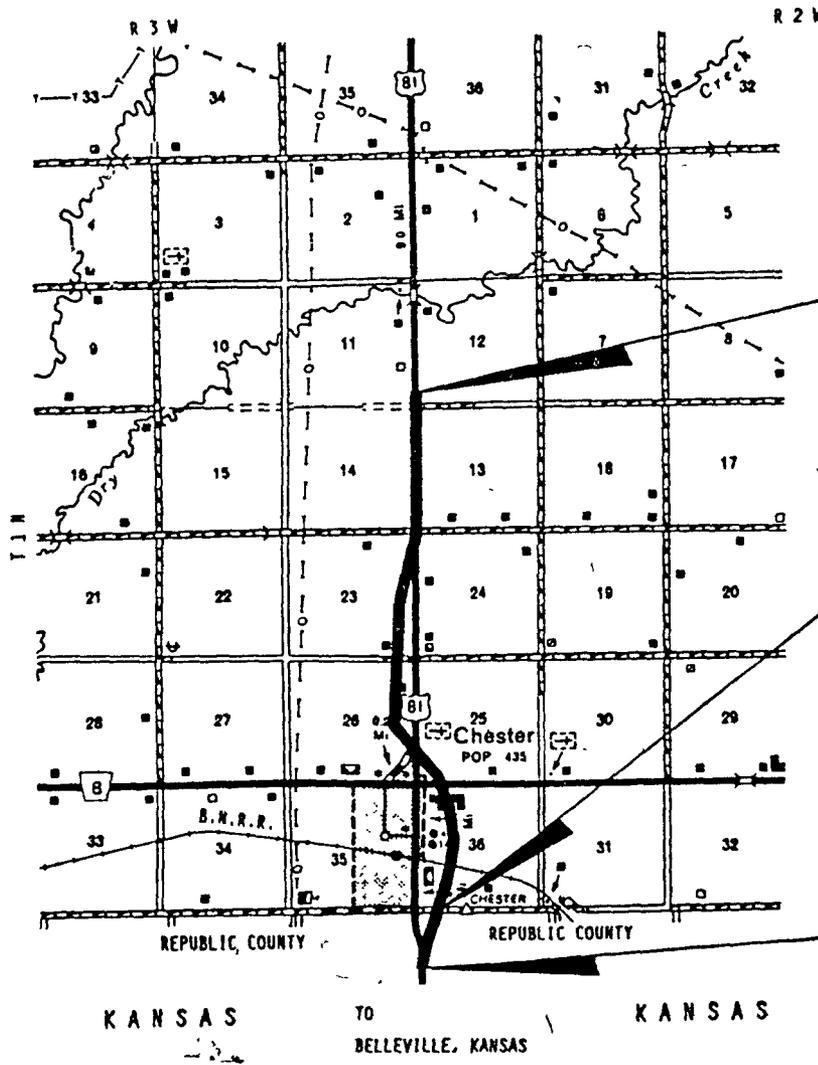


Attachment B
Project Location Map

STATE OF NEBRASKA
DEPARTMENT OF ROADS

PLANS FOR CONSTRUCTION
CHESTER NORTH
& SOUTH

THAYER COUNTY (NEBRASKA)
REPUBLIC COUNTY (KANSAS)



END PROJECT F-81-1(1016)
STA. 10490+26.74

EQUATION
STA. 430+10.43 BK = STA. 10428+18.11 AH

END PROJECT 81-79 K-4473-01 (IN KANSAS)
STA. 269+28.50

WORK ON THIS PROJECT IS AUTHORIZED FOR
CONDITIONS STIPULATED IN THE ARMY CORP
NATIONWIDE PERMIT NUMBERS AT THE FOLLOW

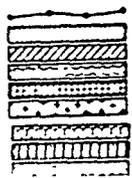
STA. 10444+57.00	NE-25B-OXT-
STA. 10449+76.00	NE-25B-OXT-
STA. 10483+18.00	NE-25B-OXT-
ENTIRE PROJECT	NE-25B-OXT-

BEGIN PROJECT F-81-1(1016)
BEGIN PROJECT 81-79 K-4473-01 (IN KANSAS)
STA. 242+00.00

REFERENCE POST NO. 0+00 TO REFERENCE POST 4+13

RAILROAD EXCEPTION: FROM STA. 289+27.41 TO STA. 289+43.41

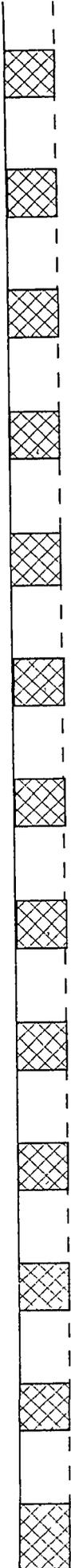
TOTAL LENGTH OF EXCEPTIONS: FEET



APPROVED Feb. 3 19

Monty W. Fredrickson

Attachment C
Test Section Layout



310124
7" AC
12" ATB/4" PATB
DRAINS
10484+00-10489+00

310123
7" AC
8" ATB/4" PATB
DRAINS
10475+50-10480+50

310114
7" AC
12" DGAB
10469+50-10474+50

310119
7" AC
4" PATB/4" DGAB
DRAINS
10463+50-10468+50

310117
7" AC
4" ATB/4" DGAB
10457+50-10462+50

310115
7" AC
8" ATB
10450+00-10455+00

310121
4" AC
4" PATB/12" DGAB
DRAINS
10444+00-10449+00

310120
4" AC
4" PATB/8" DGAB
DRAINS
10438+00-10443+00

310118
4" AC
8" ATB/4" DGAB
10429+50-10434+50

*

310116
4" AC
12" ATB
422+00-427+00

310122
4" AC
4" ATB/4" PATB
DRAINS
415+50-420+50

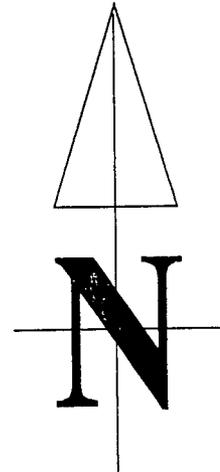
310113
4" AC
8" DGAB
408+50-413+50

SPS-09
389+50-407+00

See SPS-9 NE Map
for Section Numbers

SPS-1
THAYER COUNTY, NE
US-81 SOUTHBOUND

UPDATED 03/30/95



EQUATION: $430+10.43 BK = 10428+18.11 AH$

Attachment D
Project Deviation Report

LTPP SPS Project Deviation Report Project Summary Sheet	State Code	3	1
	Project Code	0	1
Project Classification Information			
SPS Experiment Number: SPS-01		State or Province: Nebraska	
LTPP Region:	<input type="checkbox"/> North Atlantic <input checked="" type="checkbox"/> North Central <input type="checkbox"/> Southern <input type="checkbox"/> Western		
Climate Zone:	<input checked="" type="checkbox"/> Dry-Freeze <input type="checkbox"/> Dry-No Freeze <input type="checkbox"/> Wet-Freeze <input type="checkbox"/> Wet-No Freeze		
Subgrade Classification:	<input checked="" type="checkbox"/> Fine Grain <input type="checkbox"/> Coarse Grain <input type="checkbox"/> Active (SPS-8 Only)		
Project Experiment Classification Designation (SPS 1, 2 and 8): SPS-1			
Construction Start Date: April 5, 1995		Construction End Date: July 31, 1995	
FHWA Incentive Funds Provided to Agency for this Project:			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Deviation Summary			
Site Location Deviations:	<input type="checkbox"/> No Deviations <input checked="" type="checkbox"/> Minor Deviations <input type="checkbox"/> Significant Deviations		
Construction Deviations:	<input type="checkbox"/> No Deviations <input checked="" type="checkbox"/> Minor Deviations <input type="checkbox"/> Significant Deviations		
Data Collection and Processing Status Summary			
Inventory Data (SPS 5,6,7,9): N/A	<input type="checkbox"/> Complete Submission <input type="checkbox"/> Incomplete <input type="checkbox"/> Data Not Available		
Materials Data:	<input checked="" type="checkbox"/> All Scheduled Samples Obtained and Tested <input type="checkbox"/> Incomplete		
Construction Data:	<input checked="" type="checkbox"/> All Required Data Obtained <input type="checkbox"/> Incomplete/Missing Data Elements		
Historical Traffic Data: N/A	<input type="checkbox"/> All Required Historical Estimates Submitted (SPS 5,6,7,9) <input type="checkbox"/> Required Estimates Not Submitted		
Traffic Monitoring Equipment: Site Related	<input checked="" type="checkbox"/> WIM Installed On-Site <input type="checkbox"/> AVC Installed On-Site <input type="checkbox"/> ATR Installed On-Site <input type="checkbox"/> No Equipment Installed		
Traffic Monitoring:	<input type="checkbox"/> Preferred <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Minimum <input type="checkbox"/> Below Minimum <input type="checkbox"/> Site Related		
Traffic Monitoring Data:	<input type="checkbox"/> Monitoring Data Submitted <input checked="" type="checkbox"/> No Monitoring Data Submitted		
FWD Measurements:	<input type="checkbox"/> Preconstruction Tests Performed <input type="checkbox"/> Construction Tests Performed <input checked="" type="checkbox"/> Post-construction Tests Performed		
Profile Measurements:	<input type="checkbox"/> Preconstruction Tests Performed <input checked="" type="checkbox"/> Post-Construction Tests Performed		
Distress Measurements:	<input type="checkbox"/> Preconstruction Tests Performed <input checked="" type="checkbox"/> Post-Construction Tests Performed		
Maint. & Rehab. Data: N/A	<input type="checkbox"/> Complete Submission <input type="checkbox"/> Incomplete <input type="checkbox"/> Data Not Available		
Friction Data:	<input type="checkbox"/> Complete Submission <input type="checkbox"/> Incomplete <input checked="" type="checkbox"/> Data Not Available		
Report Status			
Materials Sampling and Test Plan:	<input type="checkbox"/> Document Prepared <input checked="" type="checkbox"/> Final Submitted to FHWA		
Construction Report:	<input checked="" type="checkbox"/> Document Prepared <input type="checkbox"/> Final Submitted to FHWA		
AWS: (SPS 1, 2, & 8) Not installed yet.	<input type="checkbox"/> AWS Installed <input type="checkbox"/> AWS Installation Report Submitted to FHWA		

LTPP Project Deviation Report
Other Deviations

State Code 3 1
Project Code 0 1 0 0

Comments Pertain to All Test Sections on Project

Comments Pertain Only to Section(s): (Specify) _____

Other Deviation Comments

None.

Attachment E
Pre and Post Construction Sampling and Testing Plan

	10489+00	(SPS-1) 310124	10484+00	10480+50	(SPS-1) 310123	10475+50	10474+50	(SPS-1) 310114	10469+50	10468+50	(SPS-1) 310119	10463+50	10462+50	(SPS-1) 310117	10457+50			
C1	●	+	+	+	B-51	+	+	+	B-52	○	+	+	+	+	+			
C2	●	T501	T502	T503	□	T504	T505	T506	□	○	T510	T511	T512	T513	T514	T515		
C3	●			C5	●	C7	C9	●	○	○	C15	C16	C19	○	●	C21	C23	●
C4	●			C6	●	C8	C10	●	○	○	C17	C18	C20	○	●	C22	C24	●

Equation: 430+10.43 BK = 10428+18 11 AH



	10455+00	(SPS-1) 310115	10450+00	10449+00	(SPS-1) 310121	10444+00	10443+00	(SPS-1) 310120	10438+00	10434+50	(SPS-1) 310118	10429+50	427+00	(SPS-1) 310116	422+00			
C25	●	+	+	+	+	+	+	+	B-53	○	+	+	+	+	+			
C26	●	T516	T517	T518	T519	T520	T521	T522	□	○	T523	T524	T525	T526	T527			
C27	●			C29	●	C31	C33	○	○	○	C36	C37	C39	○	●	C41	C43	●
C28	●			C30	●	C32	C34	○	○	○	C38	C40	○	●	○	C42	C44	●

	420+50	(SPS-1) 310122	415+50	413+50	(SPS-1) 310113	408+50	401+00	(SPS-9) 310903	396+00	394+50	(SPS-9) 310902	389+50
		+	+	+	B-54	+	+	+				
		T531	T532	T533	□	T534	T535	T536				
	●	C51	C53	●	○	C55	C56	C59	○			
	●	C52	C54	●	○	C57	C58	C60	○			

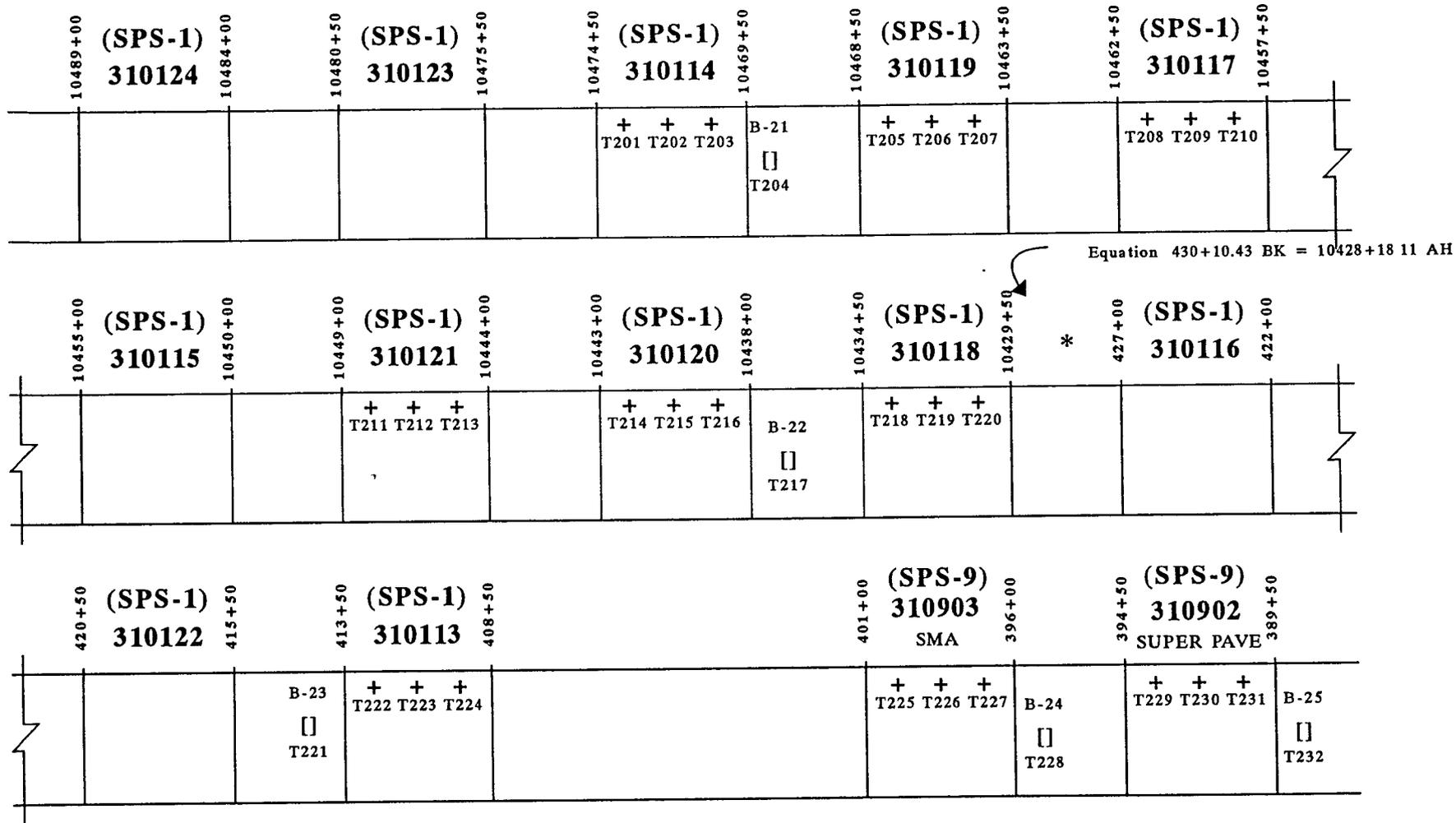
Traffic Direction

- Location of bulk sampling of asphaltic concrete mix (45kg, 100lb)
- 102 mm (4") OD core of asphalt concrete surface
- 102 mm (4") OD core of asphalt concrete surface and treated base
- +

Sampling and Testing Locations for AC Surface and Treated Base.
SPS-1&9, US-8 Southbound Lane

Updated 05/01/95





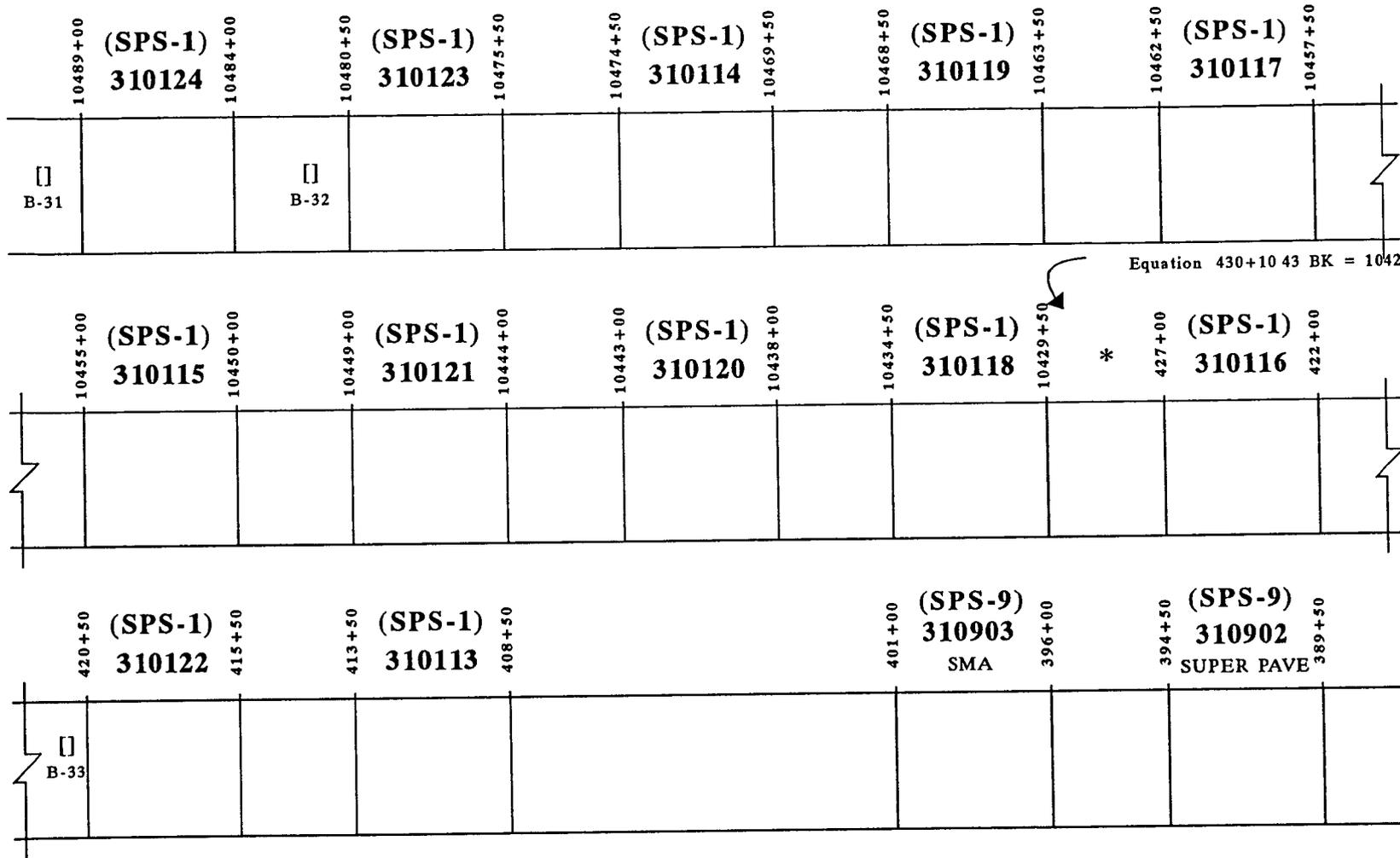
Traffic Direction

- Bulk sampling location
- + Location of field nuclear testing

**Sampling and Testing Locations for DGAB
SPS-1&9, US-8 southbound Lane**

Updated 05/01/95





Equation 430+10 43 BK = 10428+18 11 AH

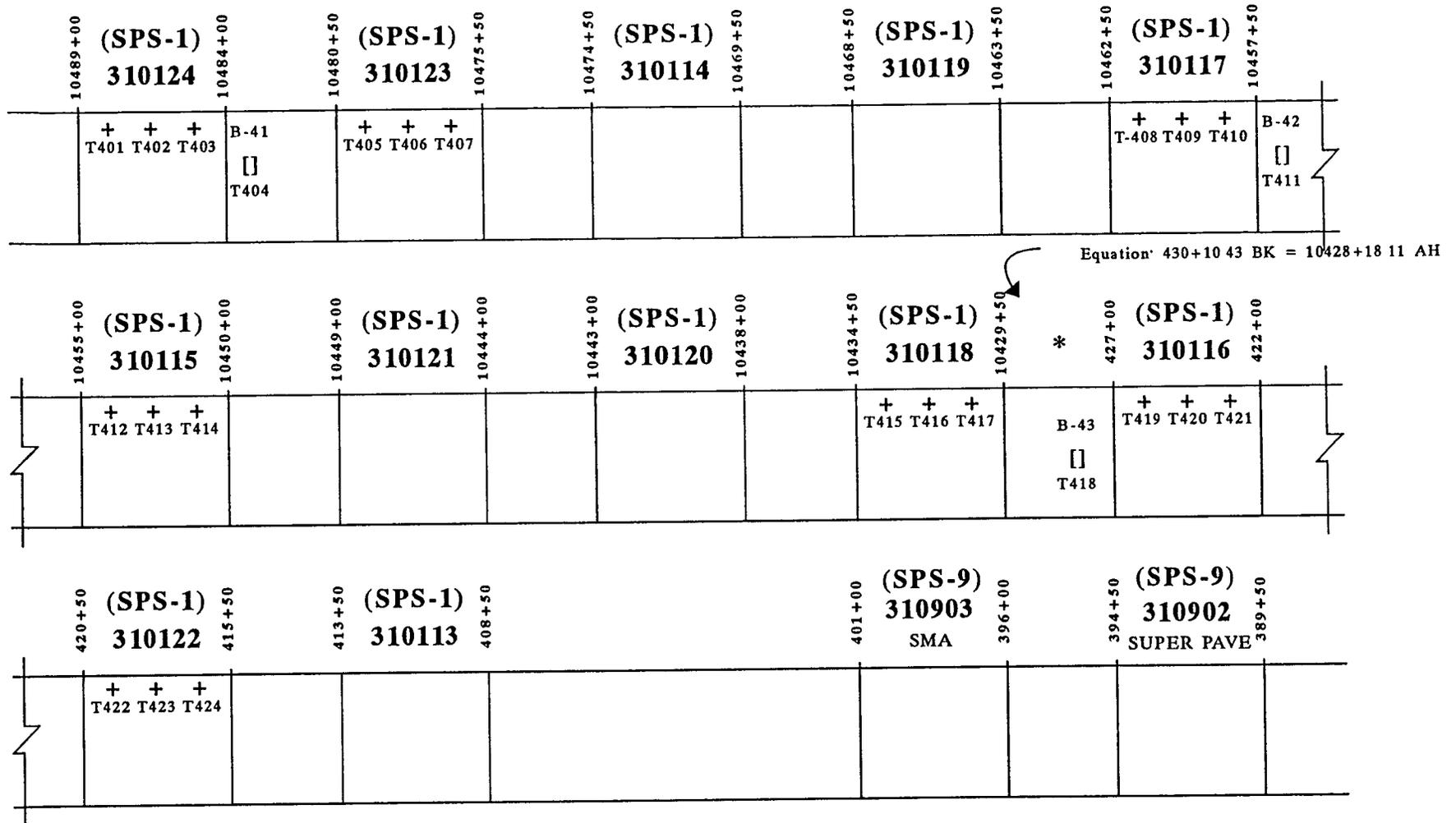
Traffic Direction

Bulk sampling location to 12" below top of subgrade

Location of Bulk Sampling of PATB
SPS-1, US-81 thbound Lane

Updated 05/01/95





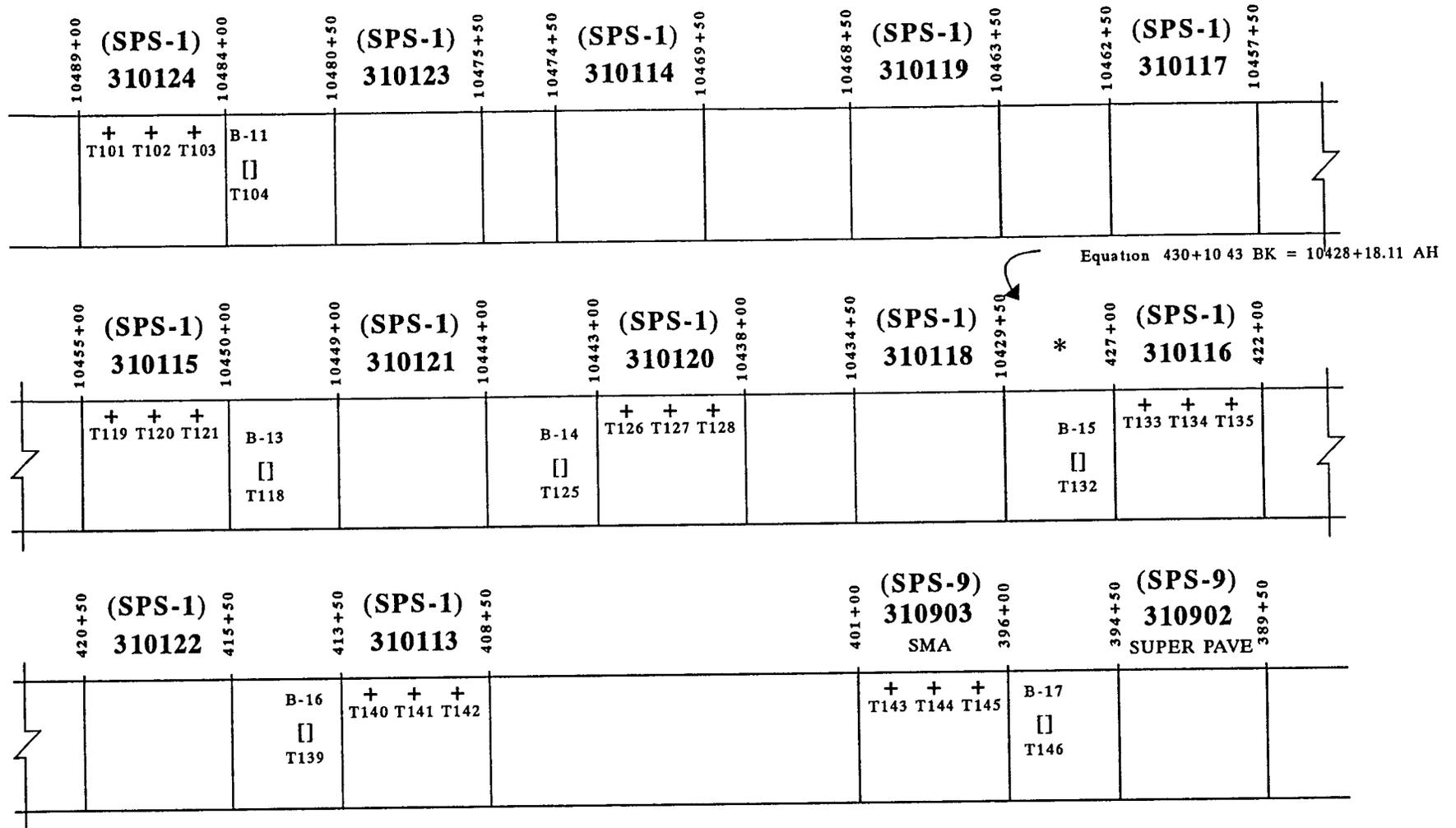
Traffic Direction 

Bulk sampling location of ATB (45kg, 100lb)
 Location of field nuclear density testing

Sampling and Testing Locations for ATB
 SPS-1&9, US-81 northbound Lane

Updated 05/01/95





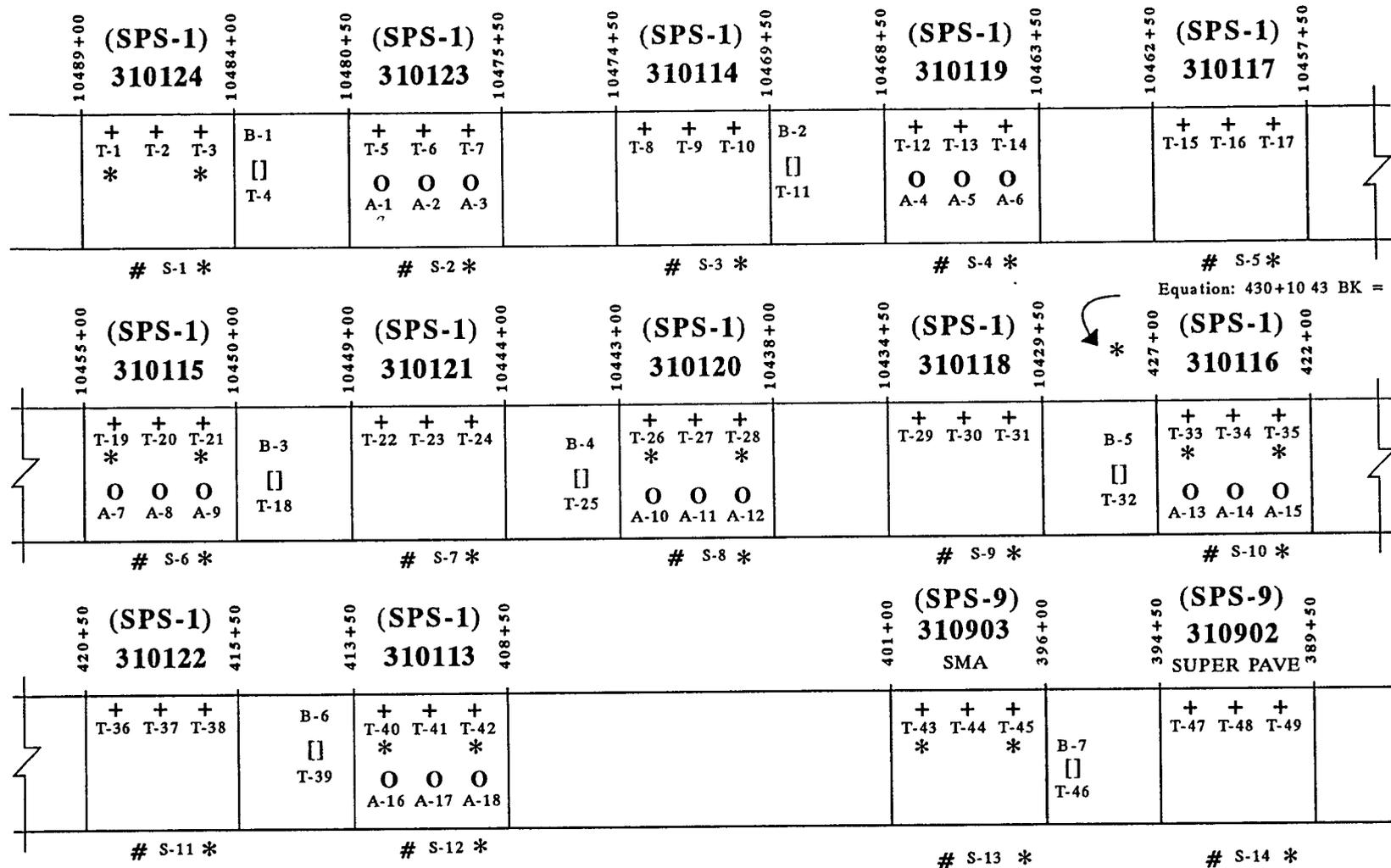
Traffic Direction

- [] Bulk sampling location to 12" below top of embankment layer
- + Location of field nuclear testing

Sampling and Testing Locations for Embankment Layer < 1.2m (4') in Depth.
SPS-1, US-81 thbound Lane

Updated 05/01/95





Equation: 430+10 43 BK = 10428+18 11 AH

* Optional Testing

Traffic Direction

- Bulk sampling location to 12" below top of subgrade
- O Thinwall tube/splitspoon sampling to 1.2m (4') below top of subgrade
- # Shoulder Probe
- + Location of field nuclear testing

Sampling and Testing Locations for Subgrade (embankment layer >1.2m (4')

SPS-1&9, US81 1thbound Lane

Updated 05/01/95



Attachment F
Samples Taken for Materials Reference Library (MRL)



Braun Intertec Corporation
6875 Washington Avenue South
P.O. Box 39108
Minneapolis, Minnesota 55439-0108
612-941-5600 Fax. 942-4844

*Engineers and Scientists Serving
the Built and Natural Environments®*

November 8, 1995

Mr. Bill Cuda
Nebraska Department of Roads
R.R. 4, Box 86
York, NE 68467

Dear Mr. Cuda:

I have reviewed our project files in reference to the samples that are stored at the Hebron Maintenance Yard. These samples were taken during the construction of the SPS-1 and SPS-9 projects on US highway 81, south of Hebron. The five gallon metal and plastic pails are to be sent to the materials reference library (MRL). This is a special facility for long term storage of materials used on the SPS projects. Nichols Consulting Engineers of Reno, Nevada are the ones managing the MRL storage facility. The shipping of the samples to the MRL storage facility will be by common carrier, and the cost will be burden by the MRL contractor (Nichols Consulting Engineers). The participating agency should contact the MRL office for exact coordination in sample shipping details. You should contact Mr. Jim Nichols at Nichols Consulting at (702) 329-4955.

A copy of the field operations information sheet form No. 1 and 2 (attached), should be completed for each of the SPS-1 and SPS-9 projects, a copy should be sent with the samples. These forms are laboratory shipment samples inventory sheets needed for tracking the materials for shipment and inventory at the MRL storage facility.

Also, mail a copy to me at:

Braun Intertec Corporation
6875 Washington Avenue South
P.O. Box 39108
Minneapolis, MN 55439-0108

I have reviewed our project files, and this should be a summary of the samples that are at the Hebron Maintenance Yard.

SPS-1

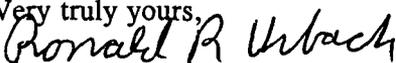
SPS Project Number	Material Type	Size of Samples
SPS-1	Asphaltic Cement Type 4 Mix	3 Five Gallon Pails
SPS-1	Finished Mix (type 4)	3 Five Gallon Pails
SPS-1	Finished Mix Asphaltic Treated Base (ATB)	2 Five Gallon Pails
SPS-1	Combined Aggregate (type 4 mix)	12 Five Gallon Pails
SPS-1	Combined Aggregate Asphalt Treated Base (ATB)	12 Five Gallon Pails

SPS-9

SPS-Project Number	Material Type	Size of Samples
SPS-9 Superpave (Section 310902)	Asphaltic Cement	3 five gallon pails
SPS-9 Superpave Plus 2 PG Grades (Section 310903)	Asphaltic Cement	1 five gallon pail
SPS-9 Superpave and Superpave plus 2 PG grades	Combined Aggregate	12 five gallon pails
SPS-9 SMA (Section 310904)	Combined Aggregate	12 five gallon pails

There is also several one gallon cans that were taken of the asphaltic cement that was used in each of the mixes. There should be eight to ten of these containers. These samples are of the asphaltic cement that may have to be tested at a later date. These samples should be shipped to the Nebraska Department of Roads testing laboratory in Lincoln.

Should you require any additional information, please contact us at your convenience.

Very truly yours,

Ronald R. Urbach, CET

Attachments
Field Operations Form 1 and 2

cc: George Woolstrum
Don Mazour
Ben Worel
Gene Skok