TX · SPS-5

FINAL REPORT - SPS-5 PROJECT

ASPHALT REHABILITATION STUDY ON US-175 IN KAUFMAN COUNTY, TEXAS

SHRP

SOUTHERN REGION COORDINATION OFFICE

July 1992

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FINAL REPORT - SPS-5 PROJECT

ASPHALT REHABILITATION STUDY ON US-175 IN KAUFMAN COUNTY, TEXAS

INTRODUCTION

As part of the Strategic Highway Research Program's (SHRP) Long Term Pavement Performance (LTPP) studies, sections of highway are being selected to apply very specific treatments to study various facets of construction (both new and rehabilitation). These projects are referred to as Specific Pavement Studies (SPS). This particular section, on US-175 in Kaufman County, Texas, was identified as a potential candidate for inclusion in the evaluations of asphalt concrete rehabilitation (SPS-5).

SPS-5, General Experiment Design

The specific products of the SPS-5 experiment are included in Table 1. In general, the experiment is intended to evaluate some of the more common asphalt rehabilitation techniques used by State Highway Agencies currently. Included in this evaluation are the condition of the pavement prior to overlay (both structurally and functionally), the loading conditions the section is exposed to (including both environment and traffic) and finally the various treatment applications. The standard SPS-5 experiment design consists of nine 500′ test sections (as shown in Figure 1). The sections include four with milling prior to overlay versus four without, four utilizing recycled mix versus four with virgin mix and thin overlays (approximately 2″) versus thick overlays (approximately 5′). The eight test sections representing the combinations of these three features are placed adjacent to one control section (to which no treatments are applied) for comparison purposes. Surface preparation referred to in Figure 1 denotes those sections where 2″ of milling is to be conducted along with patching (intensive) and those sections where only patching will be performed (minimal).

As part of the experiment, it was designated that the recycled mixture contain 30% of the Recycled Asphalt Pavement (RAP) and that the RAP material shall be the millings from the intensive surface preparation sections.

For additional information on the general experiment design for SPS-5, please refer to "Specific Pavement Studies: Experimental Design and Participation Requirements" Operational Memorandum No. SHRP-LTPP-OM-005R.

Selection/Nomination of US-175

Identification of test sections for use in the SPS Program from the State of Texas was done primarily through the review of the rehabilitation programs for the State. The section on US-175 was first noted back in June 1990 and brought to the attention of the District

TABLE 1

KEY PRODUCTS OF SPS-5

1. Comparisons and development of empirical prediction models for performance of AC pavements with different intensities of surface preparation, with thin and thick AC overlays, and with virgin and recycled AC overlay mixtures.

2. Evaluation and field verification of the AASHTO Guide design procedures for rehabilitation of existing AC pavements with AC overlays, and other analytical overlay design procedures for AC pavements.

3. Determination of appropriate timing to rehabilitate AC pavements in relation to existing condition and type of rehabilitation procedures.

4. Development of procedures to verify and update the pavement management and life-cycle cost concepts in the AASHTO Guide using the performance prediction models developed for rehabilitated AC pavements.

5. Development of a comprehensive database on the performance of rehabilitation AC pavements for use by state and provincial engineers and other researchers.

FIGURE 1

SPS-5: REHABILITATION OF ASPHALT CONCRETE PAVEMENTS

REHABILITATION PROCEDURES			FACTORS FOR MOISTURE, TEMPEREATURE, AND PAVEMENT CONDITION															
			WET								DRY							
			FREEZE				NO FREEZE				FREEZE				NO FREEZE			
SURFACE PREP	OVERLAY MATERIAL	OVERLAY THICKNESS	FAIR		POOR		FAIR		POOR		FAIR		POOR		FAIR		POOR	
Routine Maint. (Control)		0"					X											
MINIMUM	Recycled	2"					X											
	AC	5"					X											
	Virgin	2"					X											
	AC	5"					X											
INTENSE	Recycled	2"					X											
	AC	5"					X											
	Virgin	2"					X											
	AC	5'					X											

Subgrade Soil: Fine

Traffic: > 85 KESAL/Year

X = Sections on 48A500

Engineer in the Dallas District (see 6/15/90 memo from Jim Brown to James Huffman included in Appendix A). In early July 1990 a meeting was scheduled to discuss work on this project with the Kaufman County Resident Engineer and his staff along with interested parties from the Dallas District Office and the Austin Highway Design Division staff (see letter of 7/3/90 from James Sassin to Albert Harlan included in Appendix A). At this meeting (held 7/12/90), at the Kaufman County Residency, all parties agreed that this would make a suitable section and expressed their willingness to support such an effort. The project was then officially nominated on July 18, 1990. Included in the nomination "packet" are details regarding traffic, project layout, candidate project nomination and information forms, section field verification forms, calculations of the existing structural number at this location, along with the original typical section and plan profile sheets for this project (see Appendix A). The section was officially approved for use by SHRP-DC by their memo of August 27, 1990, and in turn the Texas DOT was notified of this section's acceptance on August 28, 1990.

Specific Experiment Design for US-175

The title sheet, typical sections and layout from the plans for this particular project are included as Figures 2, 3, and 4, respectively. As can be seen from these figures, this section conformed quite closely to the general experiment design guidelines. As previously noted, the recycled mix design was specified to include 30% of the recycled asphalt pavement (RAP) and this RAP material did come from the millings of this particular project. As can be seen from Figure 3, the test sections were laid out to facilitate construction. It might also be noted that these plans do not specifically call for a control test section. This SPS-5 project is immediately adjacent to GPS test section 481069 and the maintenance effectiveness (SPS-3) test section 48B300. With this in mind, it was agreed that the GPS test section and the control for the Maintenance Effectiveness Study (48B340) could also be used as controls for this SPS-5 test section.

PRECONSTRUCTION MONITORING

Numerous monitoring measurements and evaluations were made of this particular stretch of US-175 to establish its condition prior to the application of these rehabilitation treatments. Each of these will be discussed separately below.

Pavement Surface Distress

This particular stretch of US-175 was filmed March 8, 1991 by the PASCO ROADRECON unit. We do not yet have the reduced distress data from this filming, but the predominant distresses at this location were longitudinal and transverse cracking (both in significant quantities). This section did not exhibit a significant amount of rutting or fatigue cracking.

Surface Profile

In addition to the numerous rod and level measurements made immediately prior to construction (see Appendix B), this section was also profiled using SHRP's high-speed profilometer on March 19, 1991. The high-speed profilometer produces a longitudinal

RECEIVED JUL 3 1 1991

6	FR 136(24)		1
TEXAS	18	KAUFMAN	
197	3	49	US 175

STATE OF TEXAS
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL SECTION
3	TYPICAL SPS-S SECTIONS
4	QUANTITY SUMMARY
5-6	GENERAL NOTES & SPECIFICATION DATA
7-9 omitted	PROJECT LAYOUT/TCP
10	SHRP GPS & SPS SECTIONS
11	SURFACING & PAV MARK DETAILS
12-13	MISCELLANEOUS SUMMARY SHEETS
14-16	TRAFFIC CONTROL PLAN SHEETS
STANDARDS SHEETS (BELOW)	
17	TCP GENERAL NOTES
18, 18A, 19	TCP (5-1)-91, TCP (5-2)-91, TCP (5-2)-91
20-21	PM(1) & PM(2)
22-23	IPM(1)-90 IPM(2)-90
24-30	BC-(1) THRU BC-(7)-89

The standard sheets specifically identified above have been issued by me and are applicable to this project.

Albert B. Harlan P.E. 2-20-91 Date

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT
FR 136 (24)

U. S. 175
KAUFMAN COUNTY

FROM: 0.39 MILES EAST OF F.M. 148
TO: 0.60 MILES WEST OF T&NO RAILROAD (EASTBOUND LANES)

NET LENGTH OF PROJECT= 6,400.00 FT. = 1.212 MI.

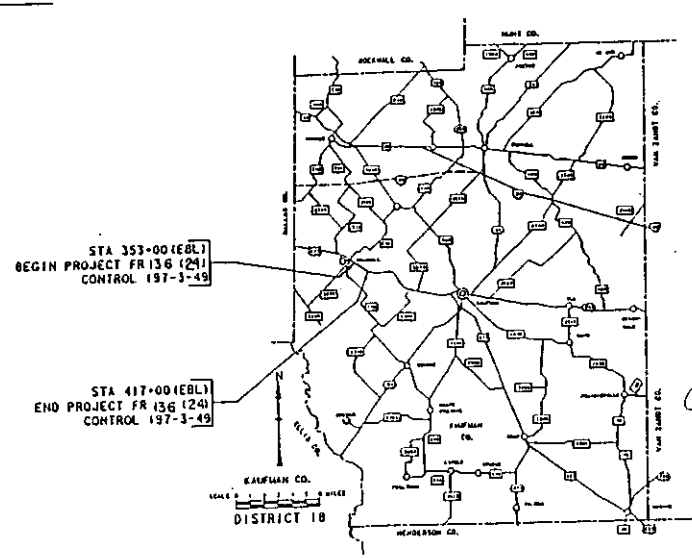
CONSTRUCTION OF THE REHABILITATION OF EXISTING ROAD CONSISTING OF PLANE ASPHALT SURFACE, FABRIC UNDERSEAL, ASPHALTIC CONCRETE PAVEMENT, HOT MIX RECYCLED BITUMINOUS PAVEMENT, ONE COURSE SURFACE TREATMENT, AND PAVEMENT MARKINGS

NOTE: THE CONTRACTOR SHALL PROVIDE AND ERECT BARRICADES AND WARNING SIGNS IN ACCORDANCE WITH BC-(1) THRU (7)-1989 AT POINTS INDICATED AND AT OTHER POINTS AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL MAKE HIS OWN INVESTIGATION AND ARRANGEMENTS FOR RAIL DELIVERY POINTS AND TRACKAGE FACILITIES.

	CONTROL 197-3-49
ROADWAY:	6,400.000 FT. = 1.212 MI.
BRIDGE:	0.00FT. = 0.000 MI.
TOTALS:	6,400.000 FT. = 1.212 MI.

EXCEPTIONS: NONE
EQUATIONS: NONE



STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

RECOMMENDED FOR LETTING: Feb 28, 1991 — DISTRICT DESIGN ENGINEER
RECOMMENDED FOR LETTING: 2-20, 19 — DESIGNER ENGINEER
RECOMMENDED FOR LETTING: 3-1, 91 — DISTRICT MAINTENANCE ENGINEER
RECOMMENDED FOR LETTING: 3-1, 91 — SUPERVISING MAINTENANCE ENGINEER
RECOMMENDED FOR LETTING: — DISTRICT ENGINEER

APPROVED: 19
APPROVED: 19

APPROVED:
APPROVED BRIDGE ENGINEER FOR LETTING: 3-19-91
FOR CHIEF ENGINEER, HIGHWAY DESIGN

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED:
DIVISION ADMINISTRATOR — DATE

NOTE: SPECIFICATIONS ADOPTED BY THE STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION OF TEXAS, SEPTEMBER 1, 1982 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS, FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, AUGUST, 1989) AND ADDENDUM TO FHWA FORM FHWA 1273, REQUIRED CONTRACT PROVISIONS, FEDERAL-AID CONSTRUCTION CONTRACTS (FEBRUARY, 1991).

FR 136(24) KAUFMAN

FIGURE 2

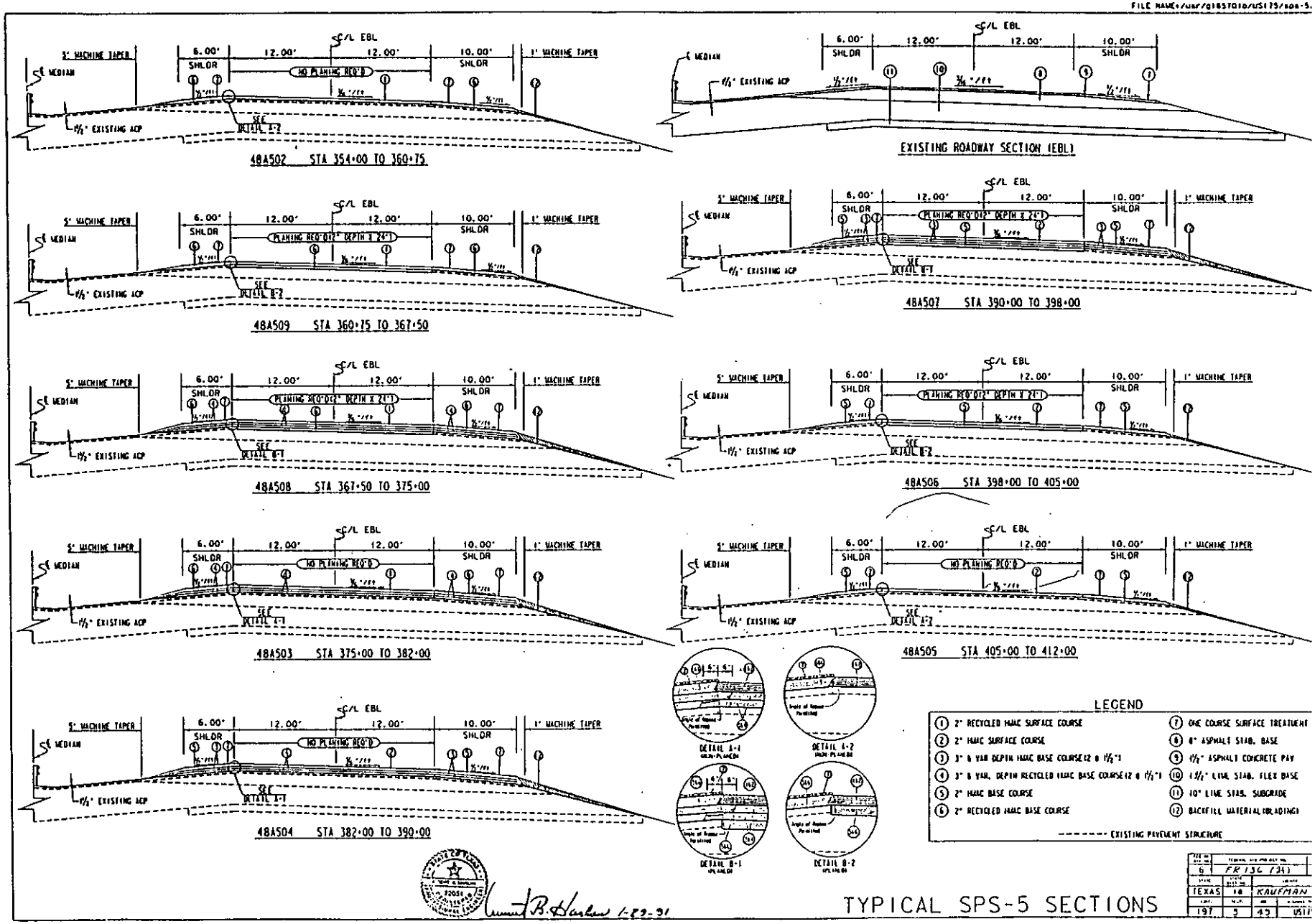

FILE NAME=/usr/0185701D/US175/sps-5.
5' MACHINE TAPER
6.00'
12.00'
12.00'
10.00'
1' MACHINE TAPER
℄/L EBL
SHLDR
MEDIAN
NO PLANING REQ'D
PLANING REQ'D 1/2" DEPTH X 24'
1 1/2" EXISTING ACP
SEE DETAIL A-2
SEE DETAIL B-2
SEE DETAIL B-1
SEE DETAIL A-1
48A502 STA 354+00 TO 360+75
48A509 STA 360+75 TO 367+50
48A508 STA 367+50 TO 375+00
48A503 STA 375+00 TO 382+00
48A504 STA 382+00 TO 390+00
EXISTING ROADWAY SECTION (EBL)
48A507 STA 390+00 TO 398+00
48A506 STA 398+00 TO 405+00
48A505 STA 405+00 TO 412+00
DETAIL A-1
DETAIL A-2
DETAIL B-1
DETAIL B-2
LEGEND
1 2" RECYCLED HMAC SURFACE COURSE
2 2" HMAC SURFACE COURSE
3 3" & VAR DEPTH HMAC BASE COURSE(2 @ 1 1/2")
4 3" & VAR. DEPTH RECYCLED HMAC BASE COURSE(2 @ 1 1/2")
5 2" HMAC BASE COURSE
6 2" RECYCLED HMAC BASE COURSE
7 ONE COURSE SURFACE TREATMENT
8 8" ASPHALT STAB. BASE
9 1 1/2" ASPHALT CONCRETE PAV
10 1 1/2" LIME STAB. FLEX BASE
11 10" LIME STAB. SUBGRADE
12 BACKFILL MATERIAL (GRADING)
EXISTING PAVEMENT STRUCTURE
TYPICAL SPS-5 SECTIONS
FR 136 (31)
TEXAS
KAUFMAN
197
5
43

FIGURE 3

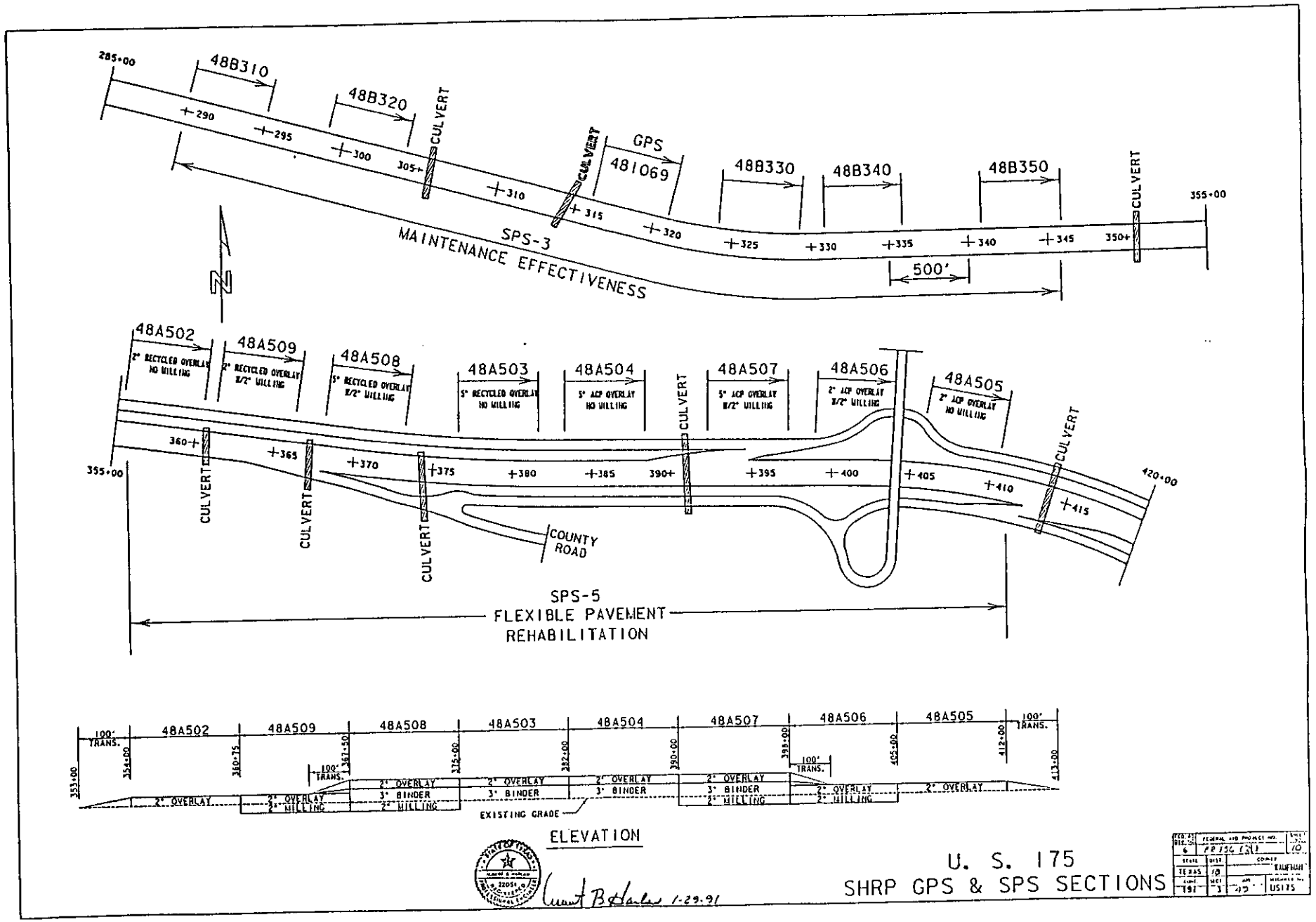

285+00
48B310
48B320
CULVERT
GPS
481069
48B330
48B340
48B350
355+00
SPS-3
MAINTENANCE EFFECTIVENESS
500'
48A502
48A509
48A508
48A503
48A504
48A507
48A506
48A505
355+00
420+00
COUNTY ROAD
SPS-5
FLEXIBLE PAVEMENT
REHABILITATION
100' TRANS.
2" OVERLAY
3" BINDER
2" MILLING
EXISTING GRADE
ELEVATION
U. S. 175
SHRP GPS & SPS SECTIONS

FIGURE 4

profile of the travel lane for each section at 6″ increments. Results of this work are included in Table 2. Rut depth measurements for this test section are included in Table 3.

Structural Capacity

Deflection measurements were taken April 29-May 1, 1991, using the SHRP Falling Weight Deflectometer (FWD) to evaluate the structural capacity of each of these test sections. The FWD drops a series of varying weights in a set pattern at 25′ intervals to measure the structural response (deflection) of the pavement. Results of this deflection testing are included as Appendix C.

Materials Sampling and Testing

As specified for all SHRP test sections, a thorough materials sampling and testing program was established for these sections on US-175 in Kaufman County (see Appendix D). Sampling included extractions of 4″, 6″ and 12″ diameter pavement cores, 6″ auger probes, 12″ bore holes, and several 6′ × 4′ test pits to a depth of 12″ just below the top of the untreated subgrade. All sampling and testing was contracted by the state. Preconstruction sampling was conducted July 9 and 10, 1991, and coordinated with Steve Davis of the SHRP Southern Region Coordination Office. Steve was present for all preconstruction materials sampling and field testing. We have not received any lab test results to date.

CONSTRUCTION

The following text details any and all unusual features relating to the construction and completion of the asphalt rehabilitation on US-175 in Kaufman County for inclusion in SHRP's SPS-5 study as Sections 48A501 through 48A509. For the purposes of discussion here, "unusual" features will be defined as that information which cannot be or has not been recorded elsewhere on the data forms associated with this project, or those features which are considered to be particularly unique to this project. The construction data forms themselves are included as Appendix E.

The project, Control Section Job No. (CSJ) 197-03-049 in the eastbound lanes of US-175 in Kaufman County, went from 0.39 miles east of FM-148 to 0.6 miles west of the T&NO Railroad (for a total of 1.212 miles). This length was limited to that necessary for completion of the SHRP test sections. The plans for this project were approved for letting by the Highway Department March 19, 1991. The project was officially let for bid in June 1991. A total of four bids were received, with the low bid going to Brown & Root out of Houston, Texas. Their total bid of $316,881.24 plus "Miscellaneous Costs" of $1,000 was 11.73% over the engineers' estimate of $284,611.50. The Preconstruction Meeting for this project was held in Kaufman at the Resident Engineer's office on July 18, 1991. At this meeting, it was noted that Brown & Root was waiting on parts for the recycling portion of their AC plant, but it was agreed that they could proceed with the milling operations while they awaited the receipt of these parts. The state noted that it would probably still be a week or two before the mix designs were approved for them to begin paving.

TABLE 2

PROFILE READINGS
International Roughness Index (IRI) in inches/mile

	Preconstruction Date Surveyed: 3/19/91			Postconstruction Date Surveyed: 1/20/92		
	Left	Right	Both	Left	Right	Both
481069	98.99	89.81	94.4			
48B340	120.92	112.73	116.83			
48A502	87.18	87.01	87.09	76.96	80.88	78.92
48A509	138.20	108.39	123.29	70.89	86.66	78.77
48A508	68.07	91.32	79.70	63.23	71.65	67.44
48A503	97.31	93.28	95.30	63.61	77.75	70.68
48A504	91.62	83.35	87.49	95.63	98.64	97.13
48A507	100.20	86.24	93.22	91.90	93.02	92.46
48A506	74.99	74.92	74.95	100.36	95.85	98.11
48A505	107.09	88.72	97.91	85.21	87.55	86.38
Project Avg.	111.32	99.49	105.40	73.93	83.77	78.85

TABLE 3

AVERAGE RUT DEPTHS
Date Surveyed: 3/10/91

	Leftside		Rightside	
	mm	in.	mm	in.
481069	9.5	0.4	9.9	0.4
48B340	7.1	0.3	10.0	0.4
48A502	11.5	0.5	13.0	0.5
48A503	9.8	0.4	12.9	0.5
48A504	10.5	0.4	11.0	0.4
48A505	8.5	0.3	7.8	0.3
48A506	9.1	0.4	8.8	0.3
48A507	8.9	0.4	10.1	0.4
48A508	8.3	0.3	9.1	0.4
48A509	10.0	0.4	9.4	0.4
Project Avg.	9.3	0.4	10.2	0.4

On Thursday, July 25, 1991, we collected all of our postconstruction rod and level elevation shots immediately after which the milling of Sections 48A509, 48A508, 48A507, and 48A506 was initiated and completed. On that same day (7/25/91), an additional set of rod and level elevation shots was collected on the four milled test sections to record the depth of milling at each of these four test sections. All rod and level results are included with the surface profile data (see Appendix B) for the respective test section.

A combination of rain, mix design problems and delays in the receipt of plant parts (the feed for the Recycled Asphalt Pavement (RAP) into their AC plant) postponed the paving operations until late September. Every effort was made for someone from the SRCO to be present during any and all work on these test sections, however, this was not always possible. Two trips had been made to Kaufman during the week of September 16 to witness the initiation of the paving operations, as coordinated with the Texas DOT, only to find that work was still not underway. During these trips, we did take the opportunity to visit and photograph the plant, recheck rod and level shots, touch up the pavement markings, and other such work in preparation for the paving operations.

When paving did begin on September 20, we were not present. The mill replacement with the RAP material on Sections 48A509 and 48A508 was placed Friday afternoon (9/20/91), and the first 1½" of the RAP binder on Sections 48A508 and 48A503 was placed Saturday morning. We returned to the project on Monday, September 23, to find that the work had been delayed due to rain. Although it was not currently raining, we were told that the stockpiles had gotten wet and they were going to give them a couple of days to dry out before they started paving again. This worked out pretty well, as it gave us some time to catch up on our rod and level shots and the other coordination and data collection associated with the paving done over the weekend that we had missed (as previously noted).

On Wednesday, September 25, paving started up again with the second 1½" lift of RAP binder on Section 48A508 and 48A503. Paving of the outside lane began at 12:30 p.m. and was finished by 2:00 p.m. the same afternoon. After the second lift was completed, an additional set of rod and level measurements was taken for Sections 48A508 and 48A503 (as was the case after every additional lift of hot mix was placed). The rod and level shots were then processed to establish the average lift thickness. Throughout the overlay process, test section markings were maintained on both the shoulder and the main lane to ensure that the markings were maintained as accurately as possible. This was done by extending the crosses out onto the shoulder. After the main lanes were paved, the hash mark was extended back onto the main lanes and vice versa until the final surface was placed.

On Thursday, September 26, the RAP surface was placed on all four of the RAP test sections (48A502, 48A509, 48A508, and 48A503). Paving was started in the outside lane (our test lane) at 9:30 a.m. and finished at 2:10 p.m. of the same day. Again, all of the rod and level shots were collected on the surface for each of these test sections, average surface thickness calculations were conducted, and the test sections were remarked.

There was a considerable delay between the completion of the RAP surface in late September and the placement of the virgin hot mix test sections. It is our understanding that the primary cause of this delay was associated with approval of the virgin mix designs.

From discussions with state personnel in the Kaufman Residency, I learned that this particular job had some moisture and freeze/thaw requirements that are not routinely included in state hot mix specifications, but rather are occasionally included in jobs done for the Dallas District to ensure that a certain standard is being maintained. The virgin mix designs, as I understand it, were initiated with the RAP mix designs; however, they were having problems getting the virgin mix to pass these requirements, and this was further complicated by the length of time required to complete these tests (approximately 3 weeks).

The virgin mix designs did ultimately pass these supplemental test requirements, and paving of the virgin test sections was initiated Wednesday, October 16. Representatives from the SHRP Southern Region Coordination Office were unable to be present for placement of the mill replacement material in Sections 48A507 and 48A506 on the 16th; however, we were able to return to Kaufman on the 17th to observe the placement of the first 1½" lift of the binder material on Sections 48A504 and 48A507 from 1:00 p.m. to 3:30 p.m. Rod and level shots were again collected, processed, and the test section markings were updated, as previously noted.

It should be noted that all equipment, including the laydown machine and rollers, was changed between the placement of the RAP test sections in September and the placement of the virgin mix in October. There was some concern expressed by the state personnel that the equipment brought in in October was not as good as that used for the RAP test sections; however, it did meet all the appropriate specifications and was therefore allowed for use. Pertinent data for all equipment used has been recorded for those test sections to which it applies. It should be noted that the amplitudes and frequencies for the vibratory rollers were not available, but typical ranges for the equipment used were listed in the material provided on these rollers. This information, however, was not included in the data forms, as it was not considered "site specific".

On Friday, October 18, the second 1½" lift was placed on Sections 48A507 and 48A506 from 2:30 p.m. to 5:00 p.m., and again our rod and level shots were collected, processed and the test sections remarked. Over the weekend, the second lift was placed on the inside lanes and the outside shoulder and on Monday, October 21, the surface was placed for Sections 48A504, 48A507, 48A506, and 48A505. Paving of the virgin surface took from 1:30 p.m. to 5:30 p.m. on the 21st. The final set of rod and level shots were taken and processed that evening and the section markings were replaced.

All data forms have been completed, noting the construction details and asphalt mix designs, and are included as Appendix E. The only data not available is the nuclear density measurements and profilograph measurements, as noted on Construction Data Sheet 9, and the asphalt concrete overlay mixture properties "as placed", Rehabilitation Data Sheet 8. No in situ testing is being conducted by the state other than the testing included in the Material Sampling and Field Testing Plan for SHRP. Therefore, we will have to wait for the results of that testing to complete this portion of our data forms.

POSTCONSTRUCTION MONITORING

With the completion of the treatment applications, postconstruction monitoring was initiated. These monitoring activities are identical to those conducted prior to the treatment applications, and intended to establish how these various treatment applications affect the performance of this highway.

Pavement Surface Distress

The test sections were filmed by the PASCO ROADRECON unit on January 29, 1992. Again, this film has not yet been reduced, however as one might expect, having been recently been overlaid, there is no real distress of any kind.

Surface Profile

In addition to the rod and level measurements included in Appendix B, these sections were again profiled using the SHRP high-speed profilometer on January 20, 1992. The results of this profiling are included in Table 2. Transverse profile measurements collected by the PASCO ROADRECON unit were collected January 29, 1992, but are not yet available. The plots of Rod & Level Data before and after overlay in Appendix B, exhibit the changes in the transverse profile.

Structural Capacity

Deflection measurements were again taken, after completion of the treatment applications, on February 10-13, 1992. These results are also included in Appendix C. The structural response also improved (less deflection was noted) after completion of the overlays, with the greatest improvements being noted in the sections with thicker overlays.

Materials Sampling and Testing

The postconstruction sampling and testing was conducted December 17, 1991, and unfortunately we were not included in the coordination of scheduling for this work. We have since coordinated with Southwestern Labs and attempted to verify that sampling was conducted in accordance with the guidelines set forth in the Material Sampling Plan developed for this project. We have since discovered that the samples were not taken exactly where planned (see Appendix D). Samples of the hot mix collected during construction were taken by the District Lab staff and furnished to the appropriate parties (Southwestern Labs and the University of Texas). Testing is currently underway at Southwestern Labs, although there are several tests which still cannot be accomplished (due to lack of final protocols). These tests include P06 Creep Compliance and P46 Resilient Modulus of the Subgrade. The state has agreed to conduct these tests after these protocols have been finalized, but they continue to express some concern over the timeliness of these protocols. If the funds set aside for this testing are not used before the project account is closed, the funds will be reallocated to other work.

SUMMARY

Having completed the construction and initial monitoring of these test sections, it appears that the test sections on US-175 in Kaufman County, Texas will contribute significantly to the evaluation of asphalt pavement rehabilitation. This project would not have been possible without the support of the Texas Department of Transportation. In particular, much of the credit is due to the help of people like Gary Charlton, Gary Andrews, Billy Martin and Charles Little. Their willingness to provide the additional work necessary to make this project possible is greatly appreciated. With the construction completed, we will now continue to monitor these sections with time, noting changes in the surface distress, surface profile and structural capacity, and compare those changes against the loadings these sections are exposed to (both environmentally and from traffic) and in combination with other projects like this one around the country, improve on existing asphalt pavement rehabilitation design methods.

APPENDIX A

SITE BACKGROUND DATA

STRATEGIC HIGHWAY RESEARCH PROGRAM

NATIONAL ACADEMY OF SCIENCES / NATIONAL RESEARCH COUNCIL
818 Connecticut Avenue, N.W., 4th Floor, Washington D.C 20006
SHRP Telecopier: (202) 223-2875 Verification: (202) 334-3774

MEMORANDUM

August 27, 1990

TO: Homer Wheeler

FROM: Amir N. Hanna

SUBJECT: Nomination for SPS-5 in Texas

We have reviewed the nomination from the Texas Department of Highways and Public Works for an SPS-5 site on US 175 (Texas DHPW nomination furnished with your submission of July 19, 1990).

The test site exhibits minor deviations from the requirements stipulated in Operational Memorandum No. SHRP-LTPP-OM-006, "Guidelines for Nomination and Evaluation of Candidate Projects for Experiment SPS-5, Rehabilitation of Asphalt Concrete Pavements", as indicated in the P-001 preliminary review. Otherwise, the proposed site meets the primary requirements for the SPS-5 experimental design for roadways in the "wet no-freeze" environmental zone. Therefore, the test site is acceptable and will be included in the experiment.

Please notify Texas DHPW staff of the acceptance of the test site and proceed with coordination of the related activities.

Enclosure (P-001 preliminary review)

cc: N. F. Hawks
D. Donnelly
P-001 (G. Elkins/TRDF, S. Tayabji/PCS)

Brent Rauhut Engineering Inc.

July 19, 1990

Mr. Gary Elkins
Texas Research and Development Foundation
6811 Kenilworth Avenue, Ste. 230
Riverdale, Maryland 20737

Subject: SPS-5 Nomination from Texas

Dear Gary,

Please find enclosed the candidate project nomination forms (see Attachment 1) for a proposed SPS-5 project located between GPS sites 481069 and 481070 and adjacent to SPS-3 site 48B3. All of these projects are in the eastbound lines of US175 in Kaufman County, between the cities of Crandall and Kaufman (approximately 30 miles southeast of Dallas, Texas). A layout of the sections located on this project is shown in Figure 1.

As can be seen from the results of our numerical grading system (total combined score of 97 - see Attachment 2), this project conforms fairly well to the criteria established for SPS-5.

All sections for this project are on 2 to 4 feet of fill. This section of US175 runs through the Trinity River bottom, which explains the fairly uniform existence of a clay subgrade beneath each of the sections located along this project. Although the traffic projections originally made for this section of US175 (15000 ADT and 13% trucks) are not entirely consistent with the traffic data collected to date for 481069 (24000 ADT and 6% trucks), both indicate a fairly high level of traffic (over 150000 ESAL's per year). The project information sheet for GPS site 481069 is provided as Attachment 3 to document the traffic originally anticipated for this site, as well as the layer information originally noted from the project's planned typical sections. From our SPS Field Verification Report (see Attachment 4), you can see that this corresponds fairly well with what was actually found in the field. The only real exception noted was the thickness of the crushed stone base, which we measured to be an average of 11 inches versus the 13 1/2 inches shown in the plans. You may note that only three holes were drilled in the vicinity of the SPS-5 project at this time (one near each end of the SPS-5 project and one in the middle). Considerable verification testing has already been conducted at the SPS-3 site, as well as all the material sampling and field testing at GPS sites 481069 and 481070. We just wanted to make sure that this section planned for use in SPS-5 was consistent with that found on the rest of the project, which it

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was. Please note that the crushed stone base was treated with 2 1/2 percent lime. Although this is not considered to be a bound base (both GPS sites 481069 and 481070 are in GPS-1), we did give this layer a slightly higher structural coefficient, when checking the structural number for this site, to account for this treatment provided. As can be seen from Attachment 5, the structural number for this project falls within the 20th percentile for a section of highway with traffic levels comparable to this one.

As can be seen from the information provided above, this project conforms quite well to all of the criteria identified for locating an SPS-5 project. The only real complication was that with so many other SHRP test sections already located along this highway, space for the SPS-5 test sections was fairly limited. In addition to avoiding all of the culverts along this facility, we were constrained at one end by the presence of the SPS-3 project (48B3) and constrained at the other end by the existence of a horizontal curve that goes through a fairly large cut and exhibited a drainage pattern considerably different from the other portions of this project. Anticipating that 481069 and/or 48B340 can be used as controls for the SPS-5 project, suitable locations for 8 SPS-5 test sections were identified.

It should be noted that an exit ramp does exist within the boundaries of one of these test sections (see Figure 1). During the afternoon that Jerry Daleiden spent on this project verifying and identifying locations for this SPS-5 project, he did not see any vehicles use this exit ramp. The ramp in question connects US175 to a frontage road that leads to an old county road. It is our strong belief that this ramp will not seriously affect the traffic stream, and it is also believed that the existence of this exit ramp within the project should have little impact on the desirability of this location for an SPS-5 project. Its presence is considered far less detrimental than the alternatives of locating a site over a culvert, or on the horizontal curve through the cut. If you should consider one of these other alternatives more desirable, we can relocate test sections as you desire so that we can take advantage of the many desirable features noted for this project.

Plan and profile sheets are also attached (Attachment 6) for your information.

This project is planned for a letting next April, so an early review of this project would be greatly appreciated. Please let us know if there is any additional information we can get you to assist you in the approval of this project.

Best Wishes,

Brent Raunut

Brent Raunut
Program Manager/SRCO

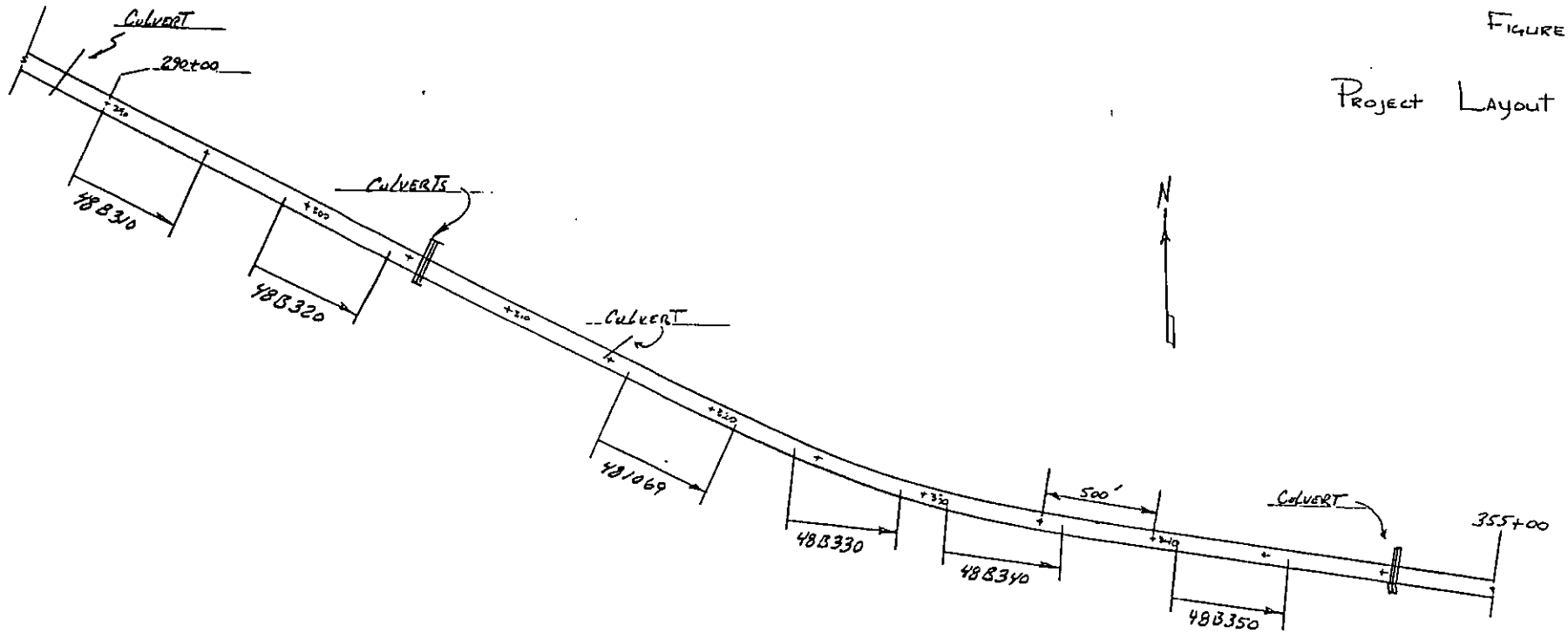
Attachments: As stated above.

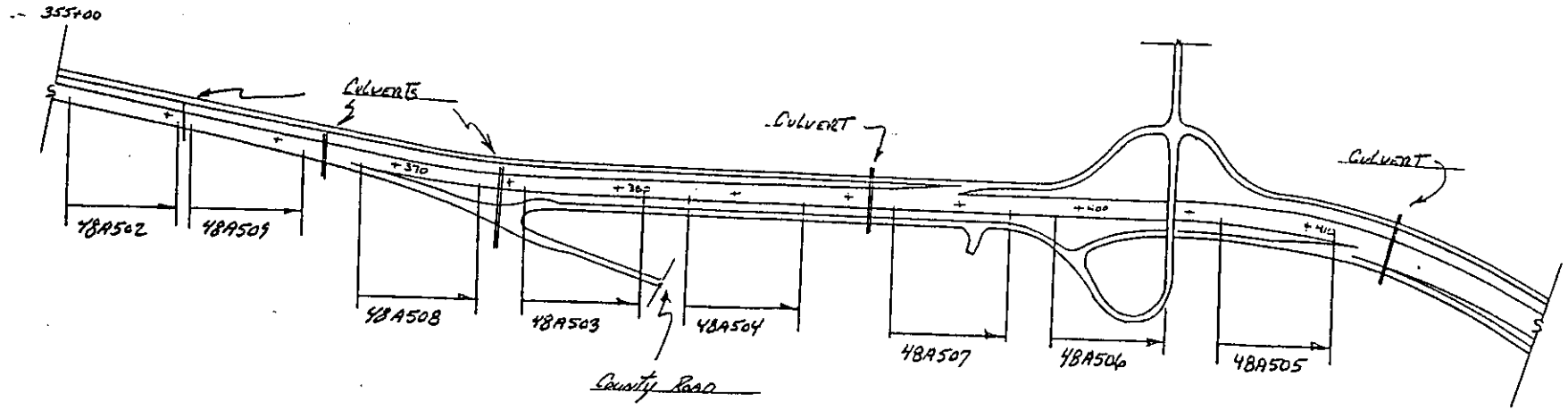
cc: Dr. Amir Hanna
Homer Wheeler

BR/rr

Figure 1

Project Layout





ATTACHMENT 1

SPS-5 Nomination Form/28 Aug 89

SHEET A. SPS-5 CANDIDATE PROJECT NOMINATION AND INFORMATION FORM

STATE TEXAS (48)

PROJECT LOCATION

ROUTE NUMBER 175

ROUTE SIGNING [] Interstate [X] U.S. [] State [] County

Other _____

PROJECT LOCATION Start Milepost _____ End Milepost _____

Start Station 354+50 End Station 412+00

PROJECT LOCATION DESCRIPTION 48A502 BEGINS 6.7 MILES EAST OF THE DALLAS / KAUFMAN COUNTY LINE. 48A505 ENDS 2.0 MILES WEST OF FM 1390 OVERPASS.

COUNTY KAUFMAN

HIGHWAY AGENCY DISTRICT NUMBER 18

SHRP ENVIRONMENTAL ZONE

[] WET FREEZE [X] WET NO-FREEZE [] DRY FREEZE [] DRY NO-FREEZE

SIGNIFICANT DATES

LATEST DATE OF APPROVAL NOTIFICATION FROM SHRP 9/90

CONTRACT LETTING DATE 2/91

ESTIMATED CONSTRUCTION START DATE 6/91

PROJECT DESCRIPTION

YEAR OPENED TO TRAFFIC 1977

NUMBER OF LANES (One Direction) 2

[X] Divided [] Undivided

OUTSIDE LANE WIDTH (Feet) 12'

OUTSIDE SHOULDER TYPE

[] Turf [] Granular [X] Asphalt Concrete [] Surface Treatment

[] PCC [] Curb and Gutter Other _____

OUTSIDE SHOULDER WIDTH (Feet) 12'

SUBSURFACE EDGE DRAINS [] Placed at initial construction [X] Not Used

[] Retrofitted Retrofit Date _____

ASSESSMENT OF PRESENT PAVEMENT CONDITION [X] Fair [] Poor

PREDOMINATE DISTRESSES

[] Fatigue Cracking [X] Other Cracking [] Potholes/Patches [] Rutting

Comments _____

SHEET C. SPS-5 CANDIDATE PROJECT NOMINATION AND INFORMATION FORM

STATE TEXAS (48)

TRAFFIC DATA

ANNUAL AVERAGE DAILY TRAFFIC (TWO DIRECTION) FROM ACTUAL COUNTS & CLASSIFICATIONS AT GPS 481069	24000
% HEAVY TRUCKS AND COMBINATIONS (OF AADT)	5.9%
COUNT YEAR OF AADT ~~ESTIMATE~~	1990
TRAFFIC GROWTH RATE SINCE PROJECT OPENED TO TRAFFIC (%/YR)	
18K ESAL RATE IN PROPOSED STUDY LANE (1,000 ESAL/YR)	158
YEAR OF ESAL RATE ESTIMATE	1990
ESTIMATED TOTAL 18K ESAL APPLICATIONS IN STUDY LANE[1]	

REHABILITATION INFORMATION[2]

PRIMARY CAUSE FOR REHABILITATION EXTENSIVE CRACKING

OVERLAY	Thickness (Inches)	Material Type Class Code
Surface Course	1.5	1
Binder Course		

SURFACE PREPARATION PRIOR TO OVERLAY

[X] Patching [X] Crack Sealing [X] Milling Depth of Mill 0"-2"

Other

OTHER CONSTRUCTION ACTIVITIES TO BE PERFORMED DURING REHABILITATION

27' WIDTH OF 0"-2" OF MILLING

24' WIDE PLACEMENT OF MEMBRANE UNDERSEAL

27' WIDTH OF 1½" HMAC O/L

27' WIDTH OF ONE COURSE SEAL COAT.

NOTES

1. Leave blank if estimate is not available.

2. This information concerns the planned rehabilitation work to be performed by the agency on the non-experimental portions of the project.

ATTACHMENT

NUMERICAL RATING SYSTEMS FOR SPS-5 CANDIDATE PROJECTS

48A5

..perimental Factors, Pavement Features For Project		Weighted Values	Project Score
Uniform type, severity and density of distress.	✓ Variation in PCI (max-min). 0-10	17	
	10-20	8	
	>20	0	
			17
Uniformity of traffic stream within limits considered for experiment.	No ramps, connections, intersections, crossovers, driveways, etc.	16	
	✓ No at-grade connections or crossings which appear to affect the truck stream in the travel lane.	8	
			8
..iformity of roadbed (cut/fill) condition.	✓ All sections in 0-8' fill.	15	
	All sections in cuts or fills no greater than 8'.	7	
	Some sections in deep cuts/fills.	0	
			15
Traffic rate	✓ >150 KESAL/YR.	13	
	85-150 KESAL/Yr.	5	
	<85 KESAL/Yr.	-5	13
Seal coat/porous friction course?	✓ None applied	13	
	Yes (One appl.)	5	
	Yes (More than one application).	-5	
			13

48A5

A. Experimental Factors, Pavement Features For Project		Weighted Values	Project Score
Subgrade type	✓ Silt or Clay: P.I. < 40 for Wet Environment.	10	
	: P.I. < 35 for Dry Environment.	10	
	Highly Expansive Clay: P.I. > 40 for Wet Environment.	0	
	P.I. > 35 for Dry Environment.	0	
	Sand or Gravel:	-40	
			10
Pavement structure	✓ HMAC (Surface and/or Base) over unbound crushed stone base or subbase. *	8	
	HMAC surface over any bituminous bound base over unbound subbase.	0	
	Other	-10	
			8 *
Geometric features	✓ No horiz. curves > 2°, no grades > 2%.	8	
	Horiz. curves > 2°, grades > 2%, but less than 4%.	2	
	Curves exceed 3°, grades exceed 4%.	-5	
			8
	TOTAL PROJECT SCORE		92

* CRUSHED STONE BASE WAS TREATED WITH 2½% LIME BUT THIS DOES NOT REALLY QUALIFY IT AS A BOUND BASE. THE ADJACENT GPS SITES 48106 & 481070 ARE BOTH IN EXPERIMENT 1.

48AE

E ius Scores For Project			Weighted Values	Project Score
WIM	Continuous.		10	
	Minimal.		0	
				___
Location relative to other sites.	✓ On same or adjacent project as other SPS or GPS test sections.	4833 481069 481070	5	
	Within 50 miles of other GPS of SPS test sections.		3	
	None of the above.		0	
				5
	Supplemental sections planned?	Yes	5	
		No	0	
				___
		TOTAL BONUS SCORE		5
		TOTAL COMBINED SCORE		97

Add to obtain project score. If it is less than 40, the project should only be used if nothing else is available.

ATTACHMENT D
CSJ 0197-03-039
COUNTY 130 (KAUFMAN)

STRATEGIC HIGHWAY RESEARCH PROGRAM
GENERAL PAVEMENT STUDIES
Long-Term Pavement Performance Monitoring
Project Information Sheet
March, 1988

REGION: Southern
STATE: Texas

EXPERIMENT: AC on Granular Base

SHRP Assigned ID:	481069	District:	18	Year Open:	1977
State Assigned ID:	179	Highway:	U.S.- 175	Year Traffic:	1985
Expmnt Design Cell:	1- 71	Length:	5.2 miles	AADT:	15000
Status:	Selected	Lanes:	2	Trucks:	13.0 %

DESIGN FACTORS:

Moisture - Wet		
Temperature - No Freeze		
Subgrade - 51 - Clay (Liq Lim>50)	Fine	
Traffic - 250 KESAL/Yr	High	(85)
AC Thickness - 9.5 in.	High	(3.0, 8.0)
Base Thickness - 13.5 in.	High	(10.0)
AC Stiffness - 602 kpsi	Low	(650)

MISCELLANEOUS:
Base Type - Granular
AC Voids - 10.3
Structural No. - 5.1

LAYER CONFIGURATION

LAYER NO.	LAYER DESCRIPTION	LAYER THICKNESS	LAYER MATERIAL TYPE
5	3 - Orig Surface	1.5	1 - Asphalt Concrete
4	4 - HMAC Below Surf	8.0	28 - Hot Mix Asphalt Concrete
3	5 - Base Layer	13.5	23 - Crushed Stone or Gravel or Slag
2	6 - Subbase Layer	10.0	36 - Lime-Treated Fine-Grained Soil
1	7 - Subgrade	.0	51 - Clay (Liq Lim>50)

PAVEMENT LAYER INFORMATION

ASPHALT CONCRETE LAYERS

LAY NUM	-- GRADE --- VISC	PENETR	AC CONT	AC DENS	S	ACVIS 140	ACVIS 275	PEN 77	AC TRBF	AC VOID	AGG SPGR	AC STIFF
5	20	0	4.9	143	4	0	0	0	.0	12.0	.000	516
4	20	0	4.8	153	4	0	0	0	.0	10.0	.000	618

ATTACHMENT 4

11/27/89

SPS
SECTION FIELD VERIFICATION FORM

Date 7/12/90

Rater Jerry Daleiden

State Project Code ___ ___ ___ ___
State Code 4 8
SHRP SPS ID A 5
GPS ID 1 0 6 9

Project and Section Identification

State District No. 1 8 County or Parish KAUFMAN

Route Signing (Numeric Code) 2
Interstate ..... 1 State 3
Primary ..... 2 Other 4
Route Number 0 1 7 5
Number of Through Lanes (One Direction) 2
Direction of Travel 1
Eastbound ..... 1 Northbound 3
Westbound ..... 2 Southbound 4

	Start Point	End Point
Test Section Milepoints	3 5 5.0 0	4 1 1.0 0

Additional Site Locations*:
Site 1 48A502: S/A 355+50 - 360+50
Site 2 48A509: 361+00 - 366+00
Site 3 48A508: 369+00 - 374+00
Site 4 48A503: 376+00 - 381+00
Site 5 48A504: 383+00 - 388+00
Site 6 48A507 392+00 - 397+00
Site 7 48A506 399+00 - 404+00
Site 8 48A505 406+00 - 411+00
Site 9 ___
Site 10 ___
Additional Sites SPS Sites 290+00 - 346+00
* Include distances from GPS site. @ 316+00 - 321+00 USE AS CONTROL

Landmark Locations: Upstream 48A502 BEGINS 6.7 MI. E. OF DALLAS/KAUFMAN C/L
Downstream 48A505 BEGINS 2.0 MI. W. OF THE FM 1390 O/P

Location of monument: ___

Geometric Information

Lane Width (Feet) 1 2.

Shoulder Data:

	Outside Shoulder	Inside Shoulder
Total Width (Feet)	1 0.	___ 4.
Paved Width (Feet)	1 0.	___ 4.

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

Additional Data for PCC Shoulders: (not applicable)
Average Joint Spacing (Feet) ___ ___ ___. ___ ___ ___.
Skewness of Joints (Feet) ___.___ ___.___
Joints Match Pavement Joints?
(Yes - 1; No - 2) ___ ___

SECTION FIELD VERIFICATION FORM (CONTINUED)

State Code 4 8
SHRP SPS ID A 5

Joint Information for JCP

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

Hole 1	Hole 2	Thicknesses Hole 3	Hole 4	Hole 5	Brief Material Description
3"	2	1.5			HMAC
7½"	8	8			ASB
13½"	11	10			LTB
10" **	10 **	10 **			LTS
					CLAY
*					
* 346+00	360+75	366+50	368+50	374+50	Station Location

Notes: ** We were able to recognize this as a "Lime Treated Subbase", however we obtained the 10" measurement from Typical Cross Section information for this Highway Segment.

Hole 6	Hole 7	Thicknesses Hole 8	Hole 9	Hole 10	Brief Material Description
2"					HMAC
8"					ASB
11"					LTB
10" **					LTS
					CLAY
*					
* 375+50	381+50	382+50	388+50	391+50	Station Location

Notes: ** See Notes above

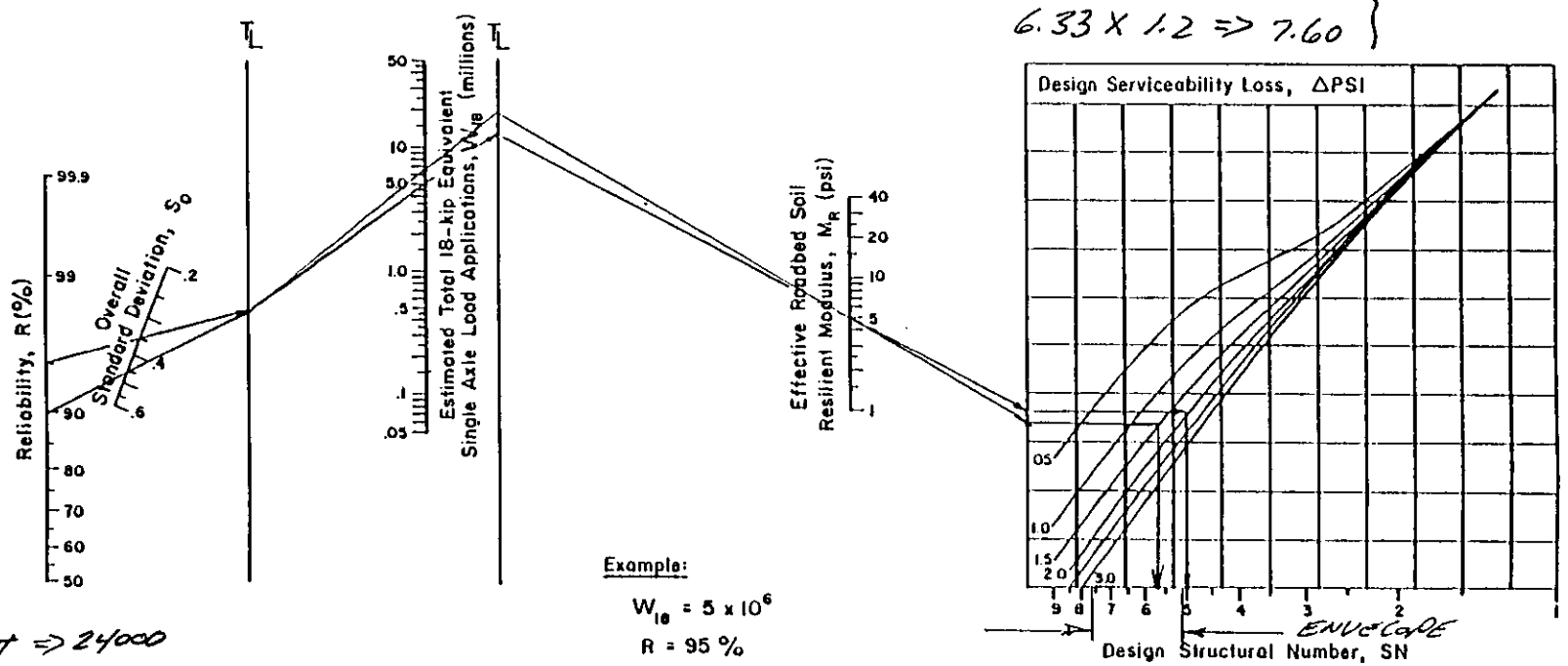
* Use these blanks to indicate the presence of Cut or Fill at each site along with the depth in feet.

NOMOGRAPH SOLVES:

$$\log_{10} W_{18} = Z_R * S_o + 9.36 * \log_{10}(SN+1) - 0.20 + \frac{\log_{10}\left[\frac{\Delta PSI}{4.2 - 1.5}\right]}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 * \log_{10} M_R - 8.07$$

HMAC .42 x 1.5" ⇒ .63
ASB .35 x 8.0" ⇒ 2.8
LTB .20 x 11" ⇒ 2.2
LTS .07 x 10" ⇒ .7
6.33

Range: 6.33 x .8 ⇒ 5.06
6.33 x 1.2 ⇒ 7.60



SN ≈ 5.7

Example:

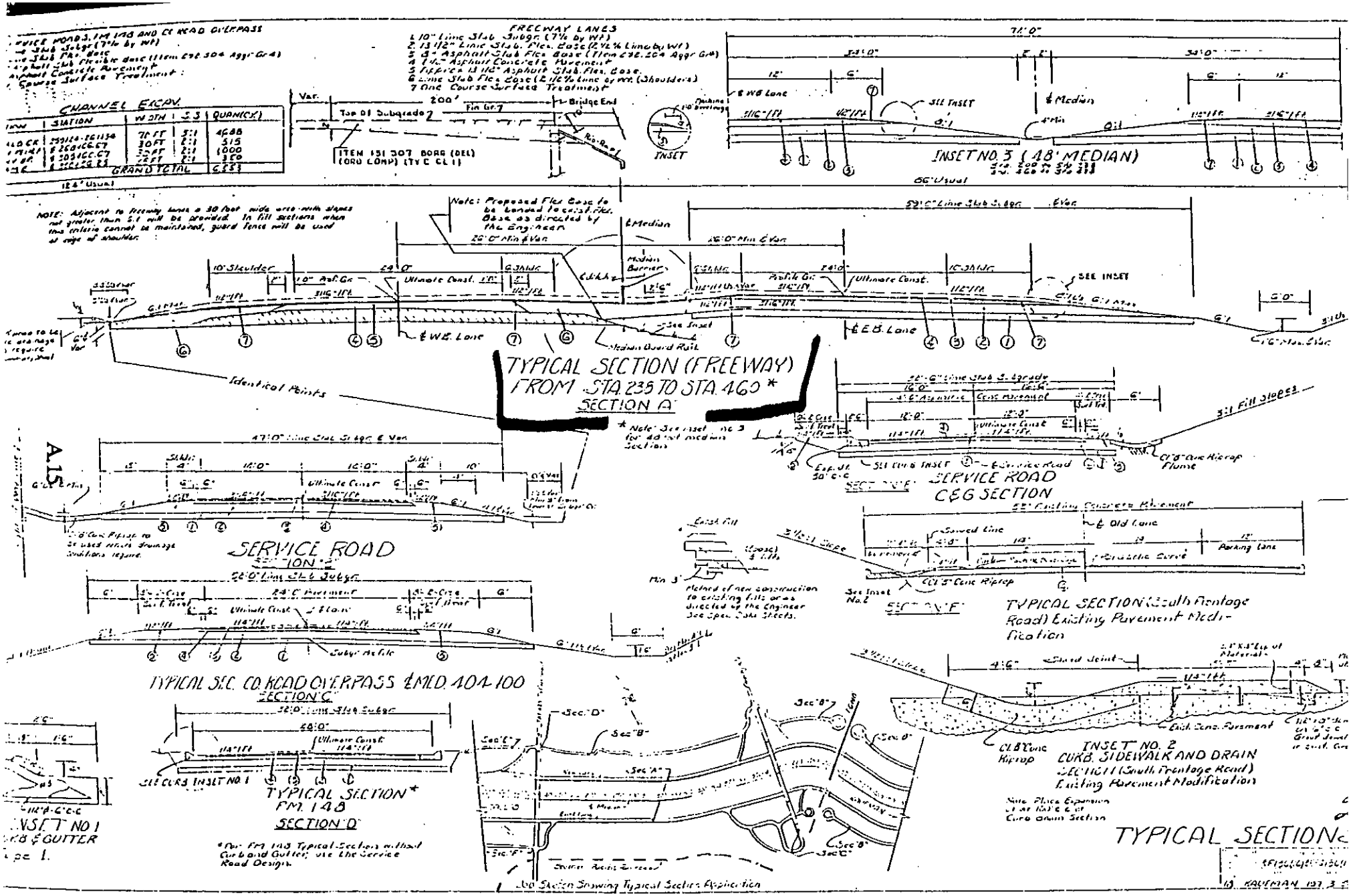
$W_{18} = 5 \times 10^6$
R = 95 %
S_o = 0.35
M_R = 5000 psi
ΔPSI = 1.9
Solution: SN = 5.0

Approx ADT ⇒ 24000
GPS Section 481069 ESAL ⇒
.158 x 10^6 ESAL AS PER GPS 481069, 5.9% TRS
(.158)(2 lanes)(20 yr period) = 6.32 x 10^6 (W_{18})

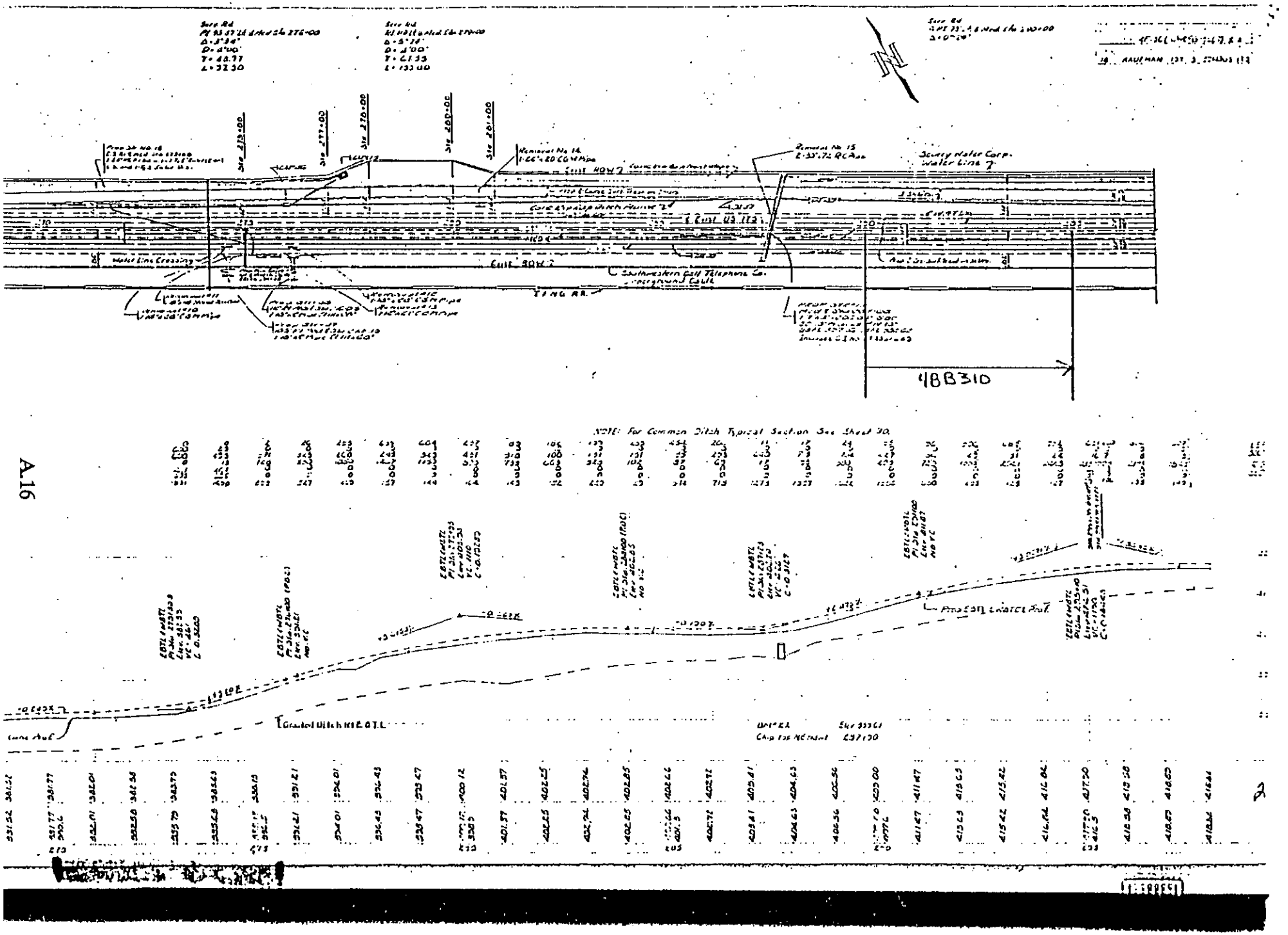
Figure 3.1. Design chart for flexible pavements based on using mean values for each input.

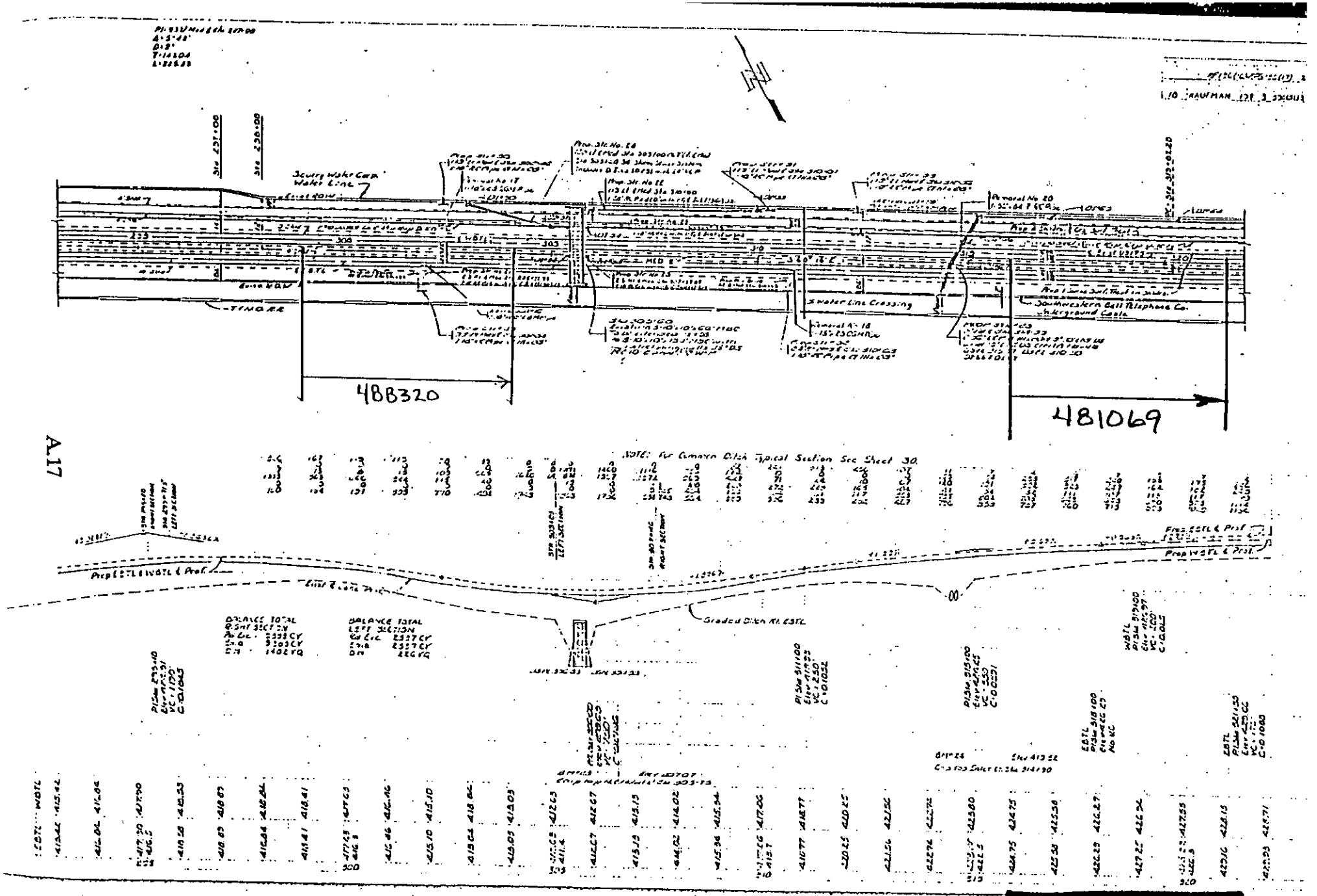
Flexible Pvmt Range ⇒ 5

ATTACHMENT 5

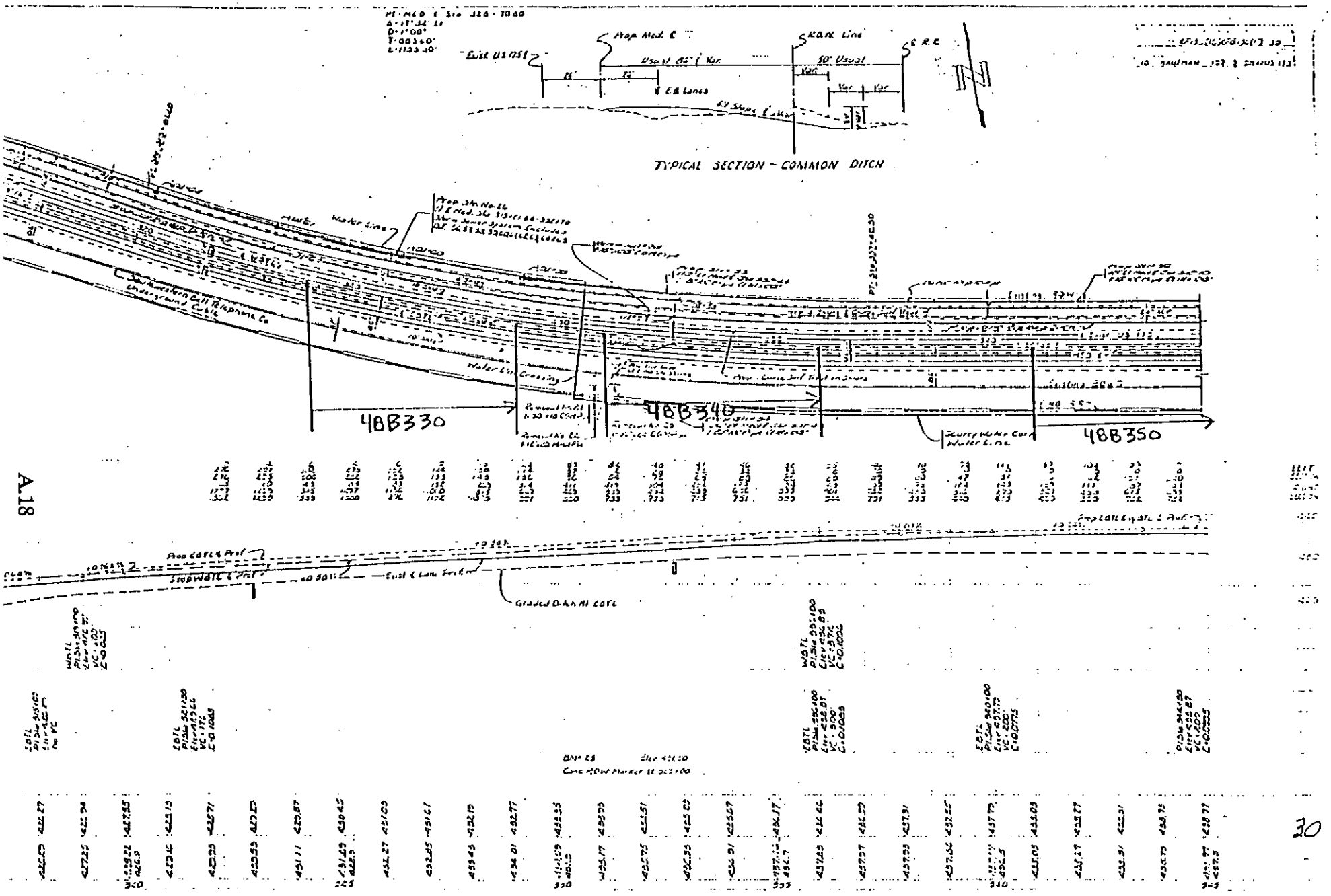

FREEWAY LANES
CHANNEL EXCAV.
GRAND TOTAL
INSET NO. 3 (48' MEDIAN)
TYPICAL SECTION (FREEWAY) FROM STA. 235 TO STA. 460 *
SECTION A
SERVICE ROAD
SECTION "B"
SERVICE ROAD C&G SECTION
TYPICAL SECTION (South Frontage Road) Existing Pavement Modification
TYPICAL SEC. CO. ROAD OVERPASS & MED. 404-100
SECTION "C"
TYPICAL SECTION * FM. 148
SECTION "D"
INSET NO. 2 CURB, SIDEWALK AND DRAIN SECTION (South Frontage Road) Existing Pavement Modification
TYPICAL SECTION
Identical Points
Typical Section Showing Typical Section Application
A-15

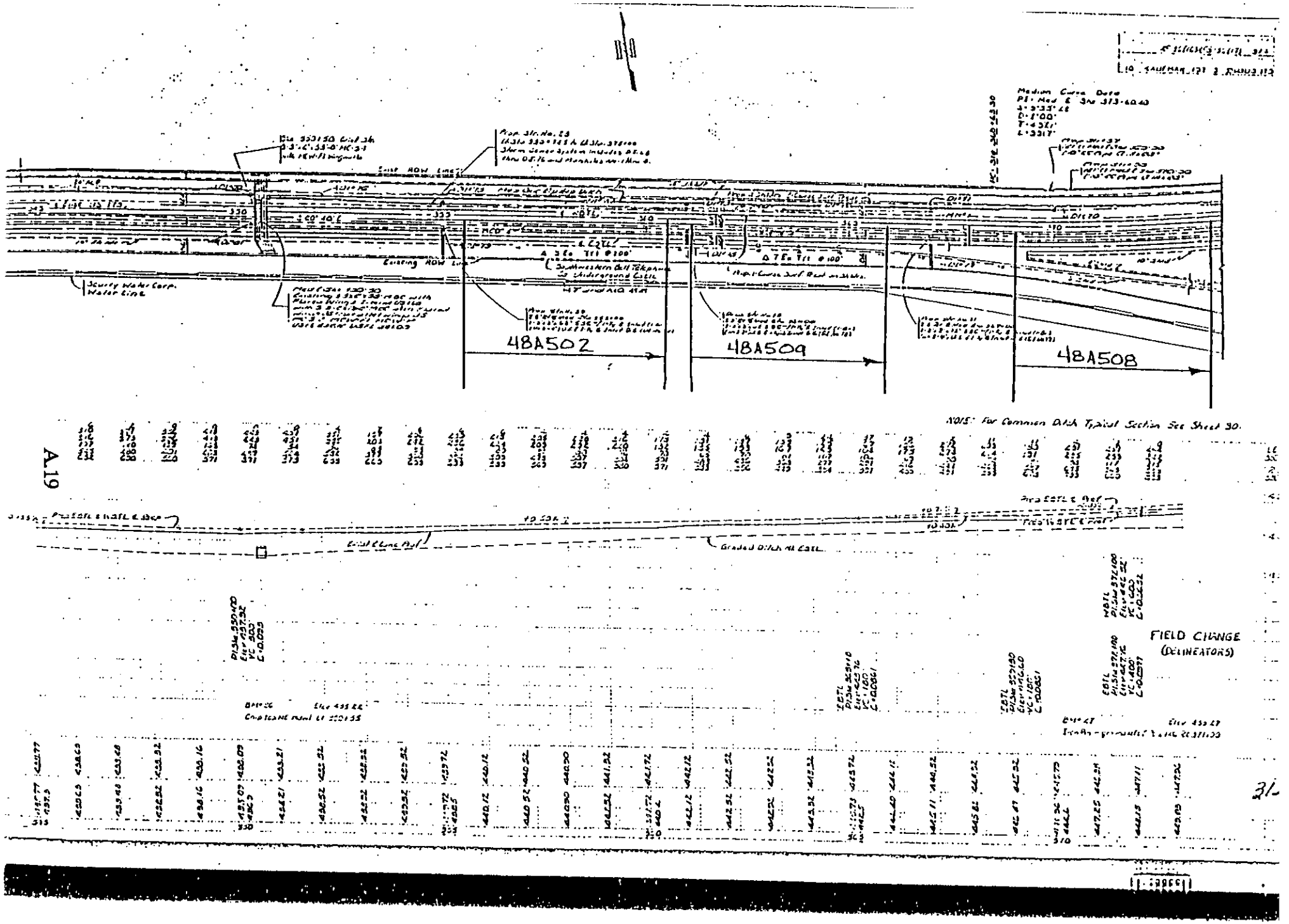
SDS UBR3

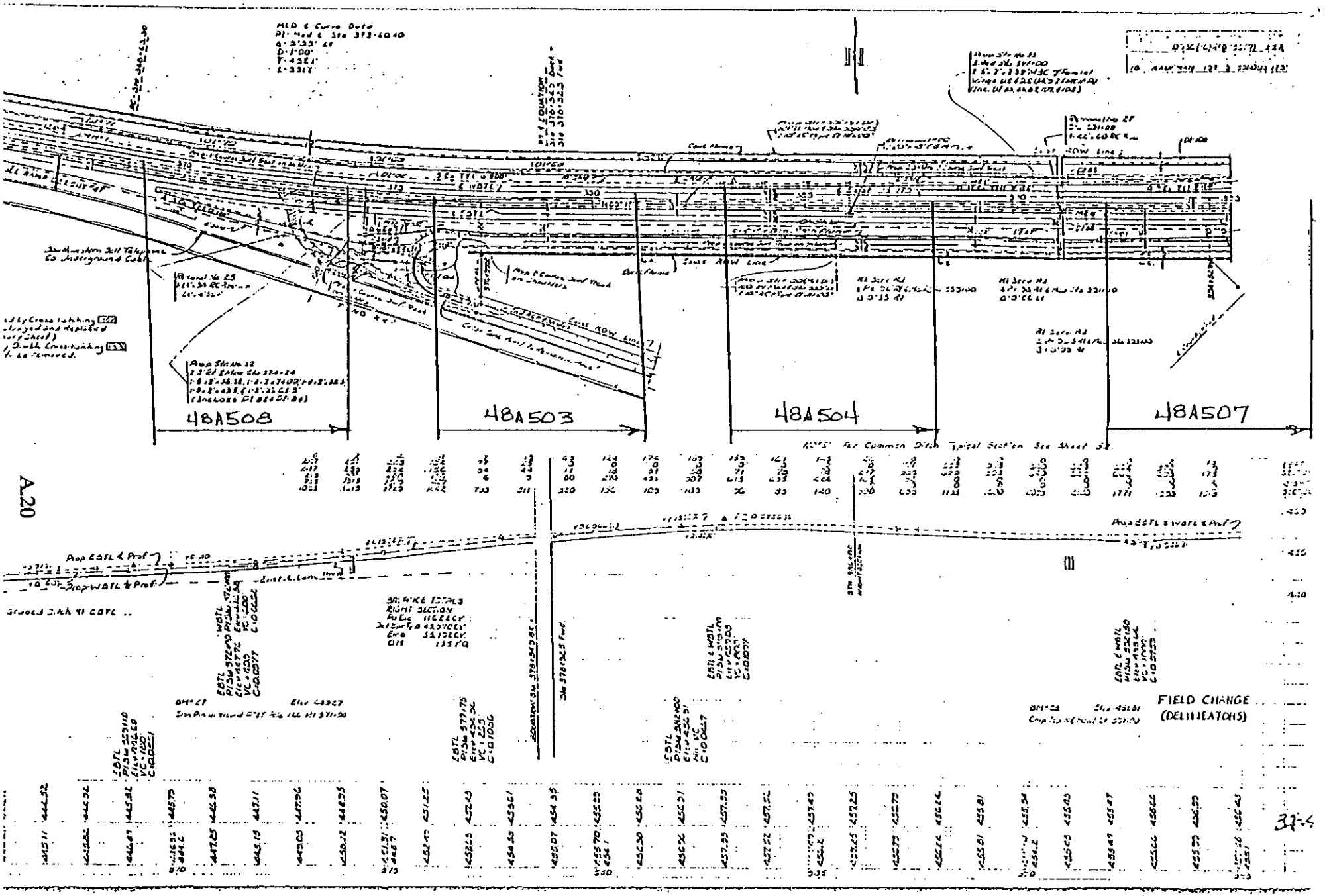

Sta 275+00
Sta 276+00
Sta 277+00
Sta 278+00
Sta 279+00
Sta 280+00
Sta 281+00
Water Line Crossing
Southwestern Bell Telephone Co.
Sewer Water Corp.
Water Line 7
48B310
NOTE: For Common Ditch Typical Section See Sheet 30.
Granted Ditch
Sta 395+61
Chip Seal

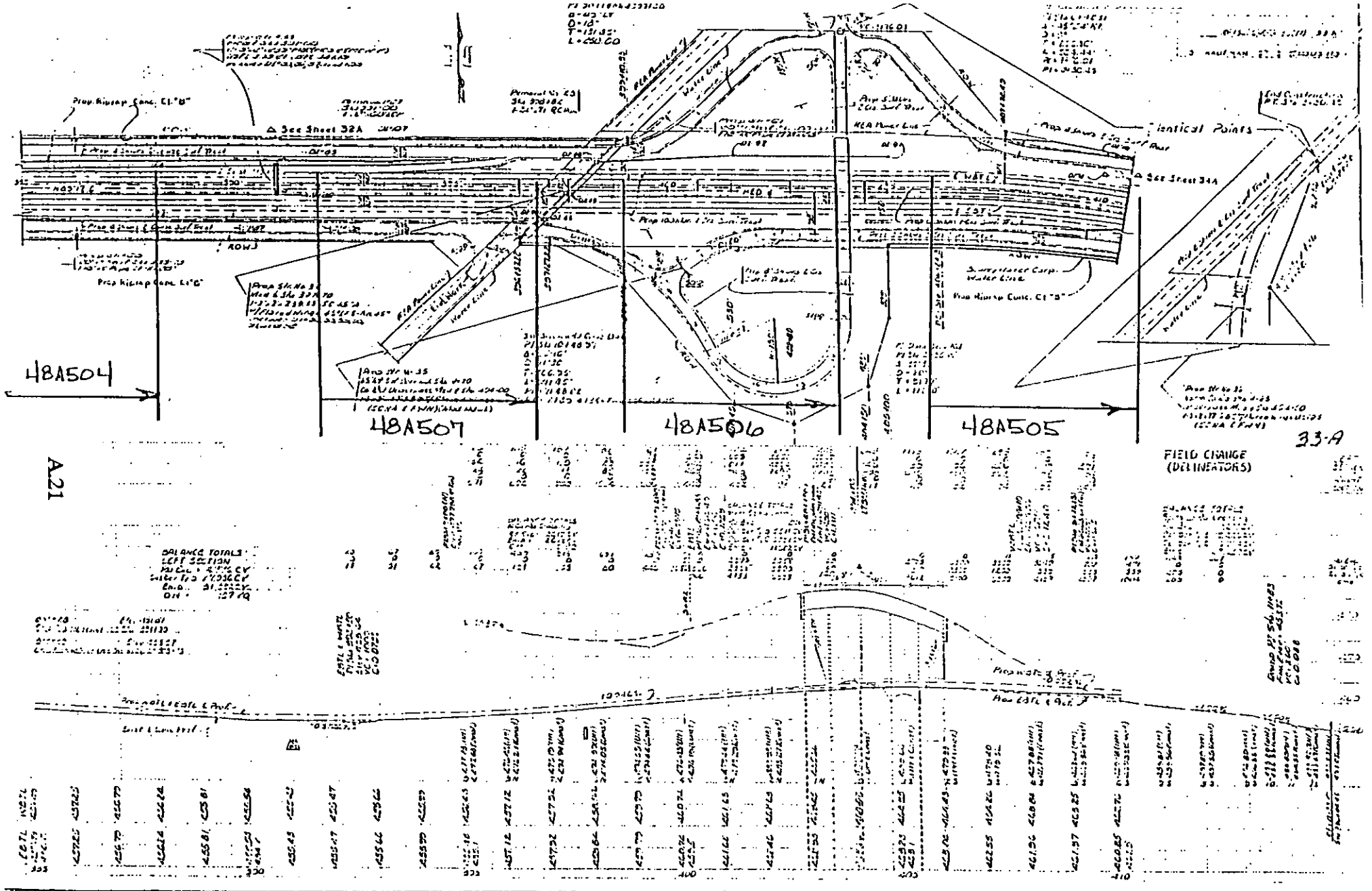

Security Water Corp. Water Line
Water Line Crossing
Southwestern Bell Telephone Co. Underground Cable
488320
481069
NOTE: For Canyon Ditch Typical Section See Sheet 30
Graded Ditch Rt. EBTL
BALANCE TOTAL RIGHT SECTION
BALANCE TOTAL LEFT SECTION

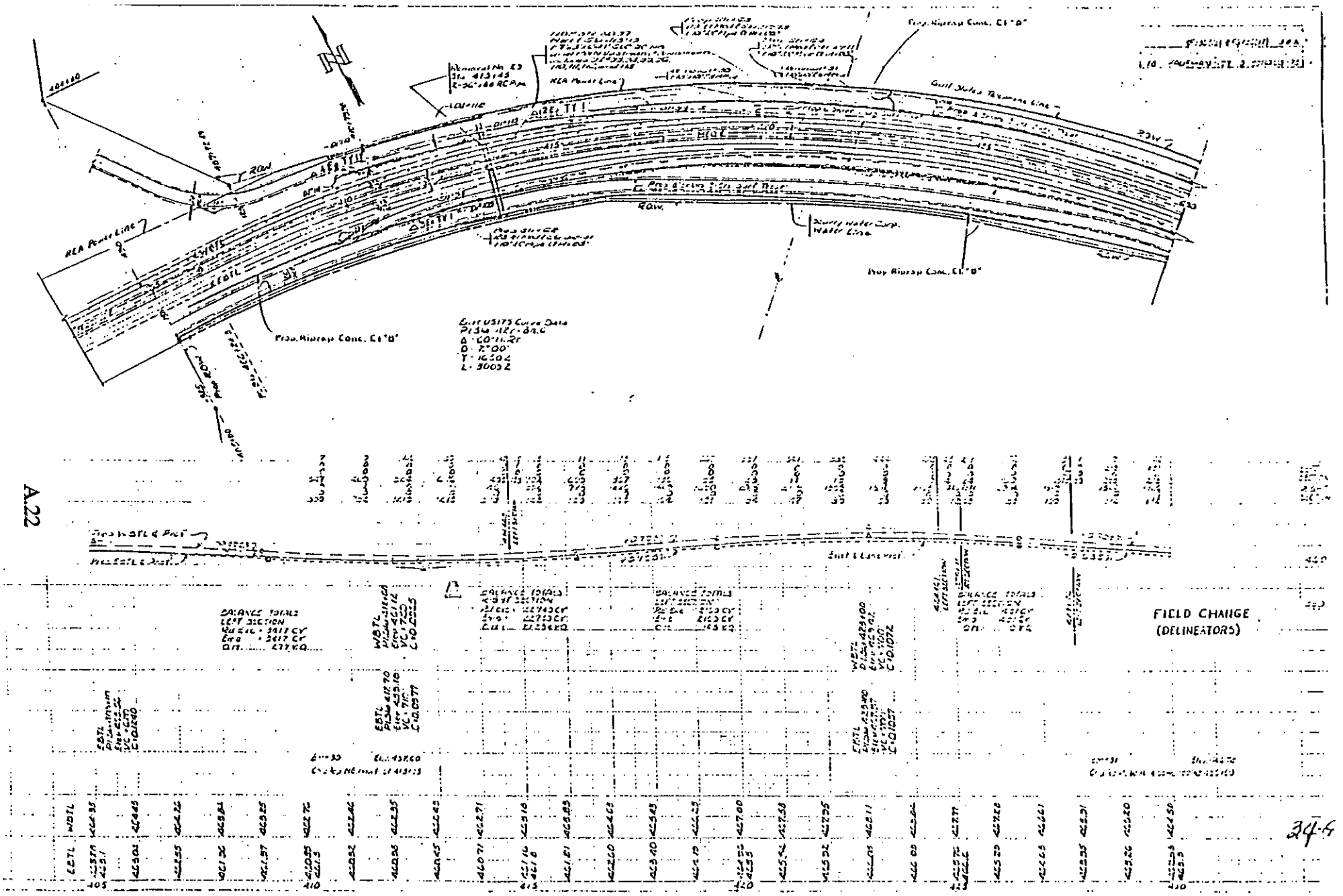
A.17


TYPICAL SECTION - COMMON DITCH
48B330
48B340
48B350
Water Line
Graded D.H.H. EOTL
30


48A502
48A509
48A508
NOTE: For Common Ditch Typical Section See Sheet 30.
FIELD CHANGE
(DELINEATORS)

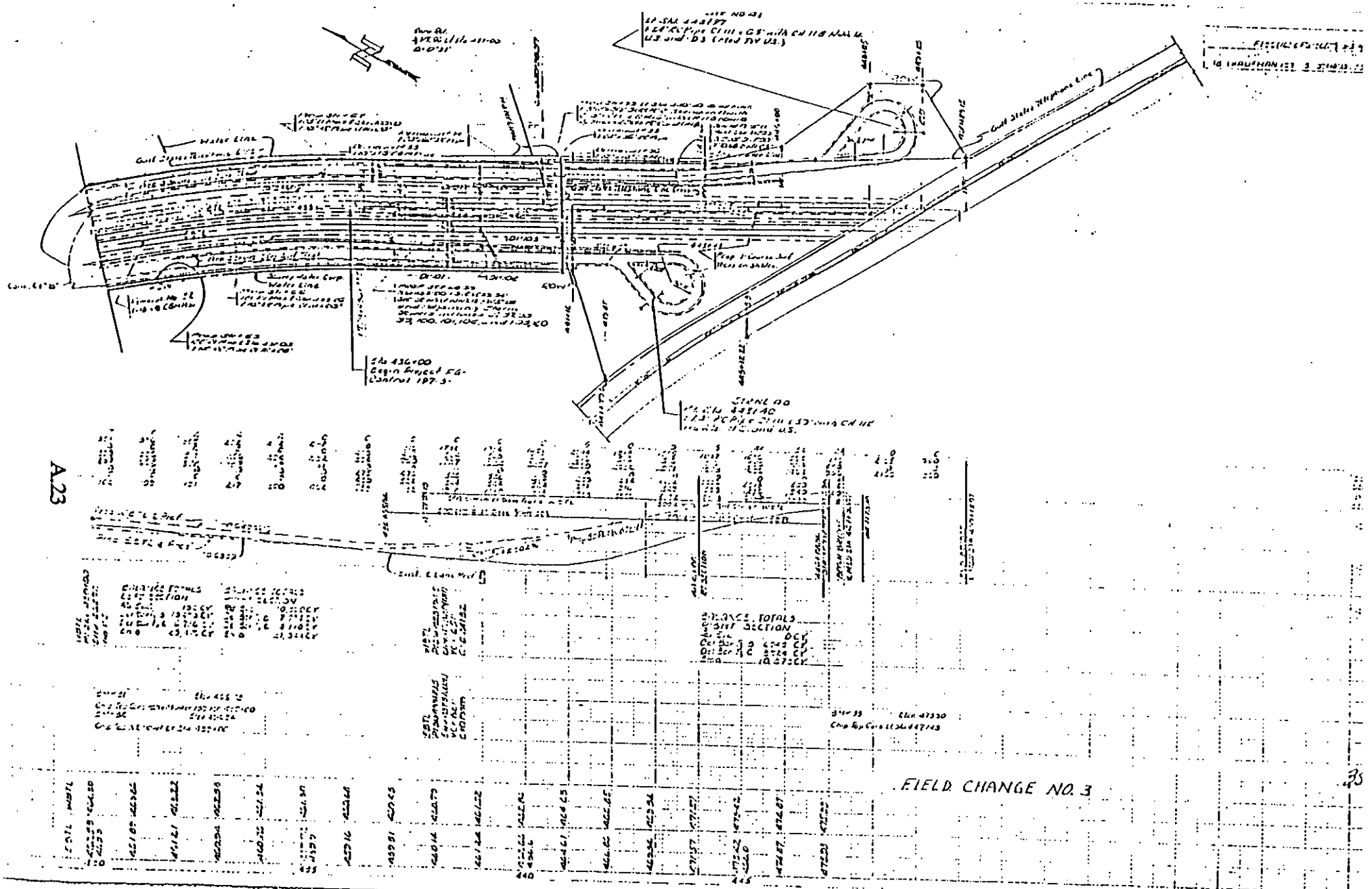

48A508
48A503
48A504
48A507
FIELD CHANGE
(DELINEATIONS)

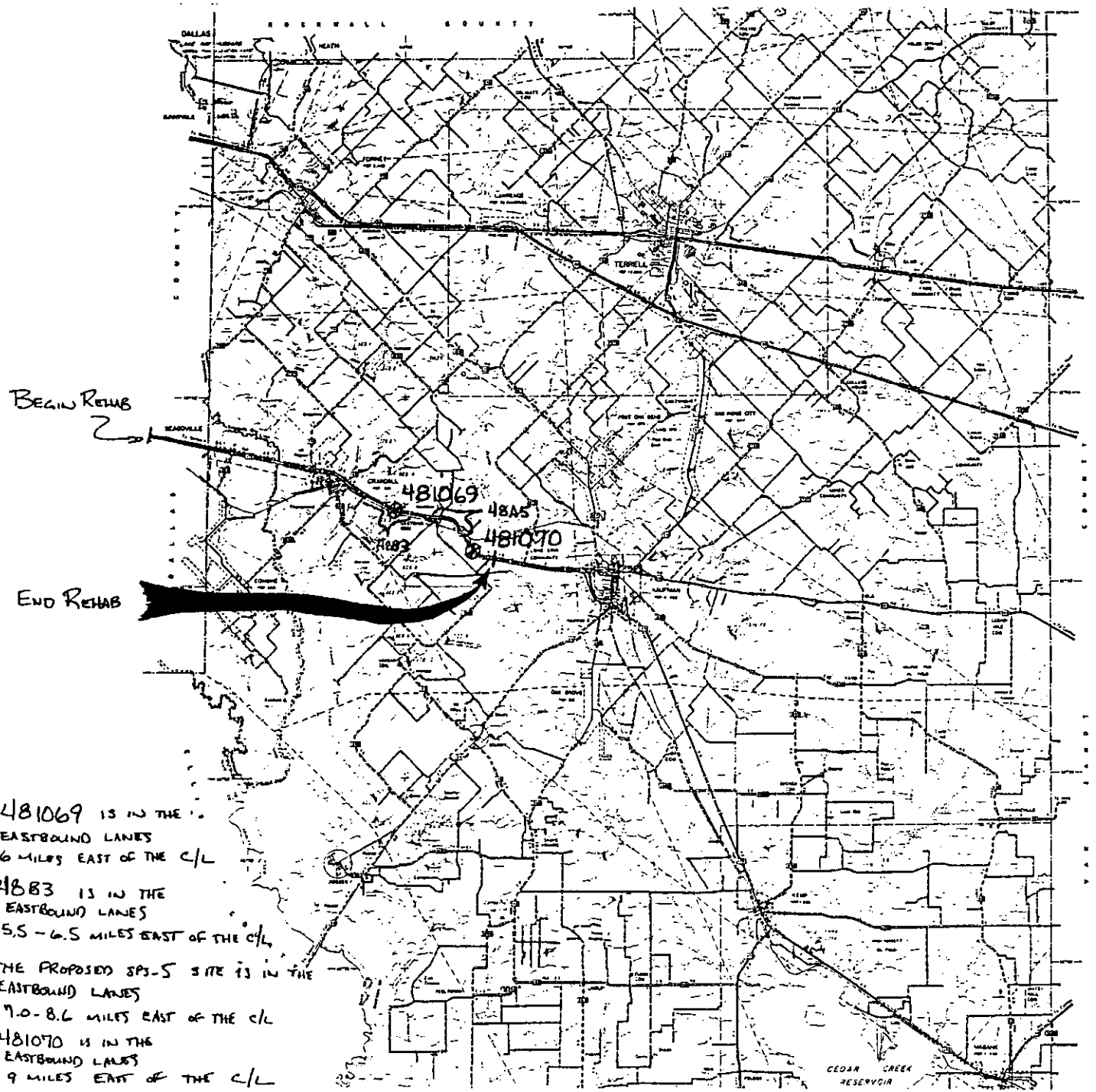

48A504
48A507
48A506
48A505
33-A
FIELD CHANGE
(DELINEATORS)
Identical Points
See Sheet 32A
See Sheet 34A
BALANCE TOTALS
LEFT SECTION

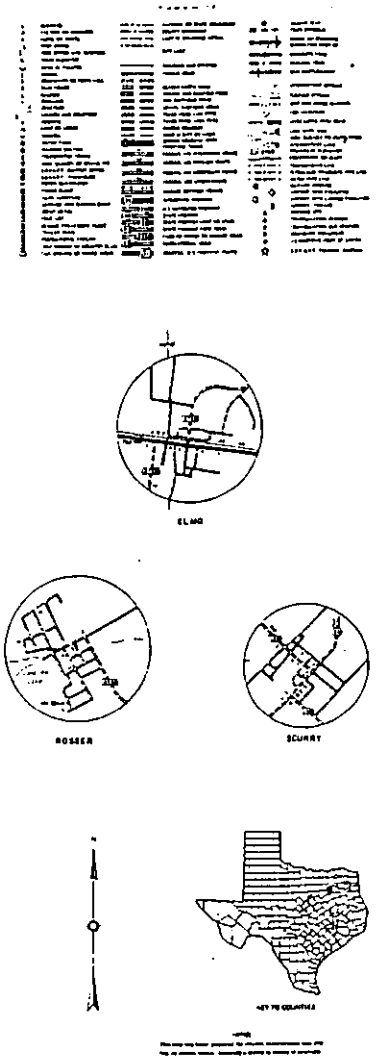

REA Power Line
Prop. Riprap Conc. Cl "B"
Prop. Riprap Conc. Cl "B"
Prop. Riprap Conc. Cl "B"
Gulf States Telephone Line
Scotty Water Corp. Water Line
ROW
FIELD CHANGE
(DELINEATORS)

A.22

34-4


FIELD CHANGE NO. 3





- 481069 IS IN THE EASTBOUND LANES 6 MILES EAST OF THE C/L
- 4883 IS IN THE EASTBOUND LANES 5.5 – 6.5 MILES EAST OF THE C/L
- THE PROPOSED SPS-5 SITE IS IN THE EASTBOUND LANES 7.0 - 8.6 MILES EAST OF THE C/L
- 481070 IS IN THE EASTBOUND LANES 9 MILES EAST OF THE C/L

RECEIVED JUL 0 5 1990

MEMORANDUM

TO: Mr. Albert Harlan
District 18, Kaufman Residency

DATE: July 03, 1990

Originating Office
D-8PD

FROM: James M. Sassin, P.E.

SUBJECT: Meeting with Strategic Highway Research Program (SHRP) Staff on July 12, 1990 to Discuss Construction of Special Pavement Study -5, (SPS-5) on US 175.

This will confirm our meeting scheduled for Thursday, July 12th at 10:00am in your office.

Those expected to be coming from Austin are: Mr. Homer Wheeler, SHRP Southern Regional Engineer, Mr. Jerry Daleiden, SHRP Project Engineer, and myself. I have briefly discussed this project with Mr. John Blain, and stressed the importance of his support. However, we are not sure who in District 18 is responsible for the Rehabilitation Program, and whether they should be at the meeting. If you think it is important to invite someone from the district office, please do so.

A few items to be discussed at the meeting are listed below:

1. The division of responsibilities between SHRP and the SDHPT.
2. The additional costs to the existing estimate to include SPS experiment and source of funding.
3. Reason for experiment.
4. Time schedule anticipated by SHRP and SDHPT.
5. Discussion about whether project meets SHRP criteria (if it does).
6. Do we proceed? If not, what next?

We invite your questions and input and expect the meeting to be somewhat informal.

Please feel free to call me at TA 258-6106 if you have any questions/concerns.

JMSpjb

cc: Mr. John Blain, District 18, Dallas
Mr. Homer Wheeler, SHRP, Austin
Mr. Jerry Daleiden, BRE, Austin
Mr. Steven Lamar, District 18, SHRP Coordinator

MEMORANDUM

TO: Mr. James Huffman
District Engineer, Dallas

DATE: June 15, 1990

FROM: James L. Brown, P.E.

Originating Office
D-8PD

SUBJECT: Strategic Highway Research Program (SHRP)
Specific Pavement Studies for Flexible
Pavement Rehabilitation (SPS-5)

After close examination of the candidate sites submitted last year for SPS-5, SHRP has informed us that they did not meet the selection criteria. (See attached memo dated May 19, 1989) We once again have reviewed the rehabilitation program and submitted candidates to SHRP. This time our review included projects in the 1991 rehabilitation program.

One of the two sites statewide that meet the criteria is in your district. It is located on US 175 in Kaufman County, 1/2 mile west of the FM 1390 overpass. So that we may begin planning for the final stages of the selection process, we would like to know with whom in District 18 we should begin coordinating this effort.

Attached is a sheet describing the typical layout of the SPS-5 experiment. Would you or someone from your office call me or James Sassin at Texan 258-6106 as soon as possible so that we may begin arranging a meeting between SHRP, our office and District 18 to discuss the distribution of responsibilities and preparation of plans.

JMS/pjb

cc: Jerry F. Daleiden, Brent Rauhut Engineering

APPENDIX B

SURFACE PROFILE DATA

Elevation Readings and Overlay Thicknesses 06–Jul–92

SECTION 48A502

Trans. Offset		0'	Overlay Depth (IN.)	3'	Overlay Depth (IN.)	6'	Overlay Depth (IN.)	9'	Overlay Depth (IN.)	12'	Overlay Depth (IN.)
0+00	PRE	103.14	1.80	103.17	2.52	103.28	1.68	103.31	2.04	103.37	2.16
	POST	103.29		103.38		103.42		103.48		103.55	
0+50	PRE	103.35	2.04	103.40	2.64	103.50	2.16	103.54	2.52	103.61	2.40
	POST	103.52		103.62		103.68		103.75		103.81	
1+00	PRE	103.60	2.04	103.64	2.76	103.74	2.16	103.78	2.40	103.85	2.52
	POST	103.77		103.87		103.92		103.98		104.06	
1+50	PRE	103.77	2.16	103.82	2.40	103.91	1.92	103.94	2.16	104.00	2.28
	POST	103.95		104.02		104.07		104.12		104.19	
2+00	PRE	103.96	1.80	103.97	2.52	104.06	1.92	104.06	2.52	104.13	2.40
	POST	104.11		104.18		104.22		104.27		104.33	
2+50	PRE	104.13	1.92	104.13	2.76	104.23	1.92	104.24	2.76	104.29	2.40
	POST	104.29		104.36		104.39		104.47		104.49	
3+00	PRE	104.37	2.16	104.39	2.40	104.50	2.04	104.51	2.28	104.55	2.64
	POST	104.55		104.59		104.67		104.70		104.77	
3+50	PRE	104.60	2.04	104.61	2.52	104.72	1.80	104.72	2.28	104.74	2.76
	POST	104.77		104.82		104.87		104.91		104.97	
4+00	PRE	104.77	1.80	104.76	2.76	104.88	2.04	104.87	2.52	104.92	2.52
	POST	104.92		104.99		105.05		105.08		105.13	
4+50	PRE	104.95	1.92	104.97	2.40	105.08	1.80	105.07	2.52	105.14	2.64
	POST	105.11		105.17		105.23		105.28		105.36	
5+00	PRE	105.22	2.16	105.22	2.88	105.32	2.16	105.30	2.88	105.36	2.76
	POST	105.40		105.46		105.50		105.54		105.59	

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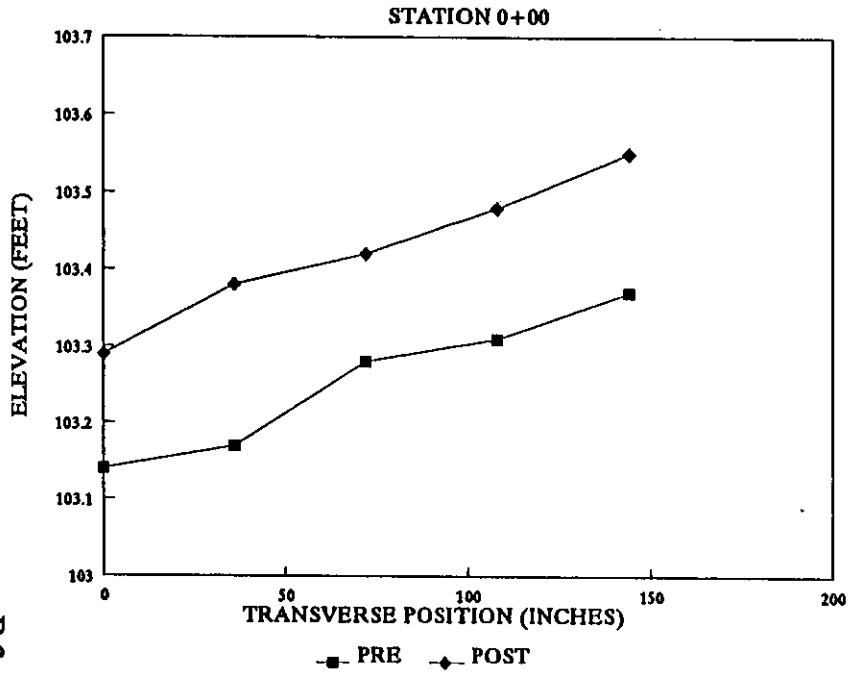
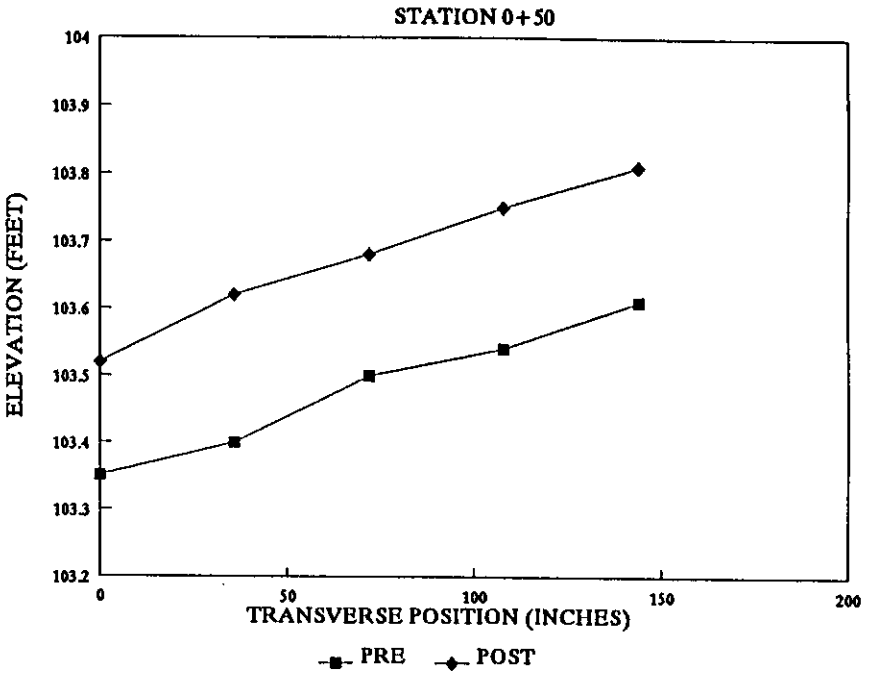
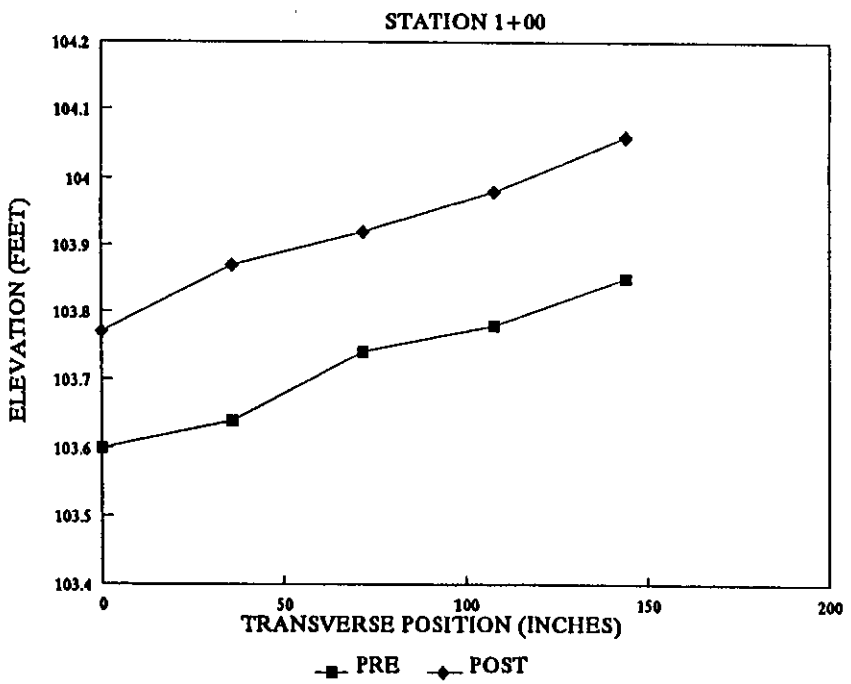
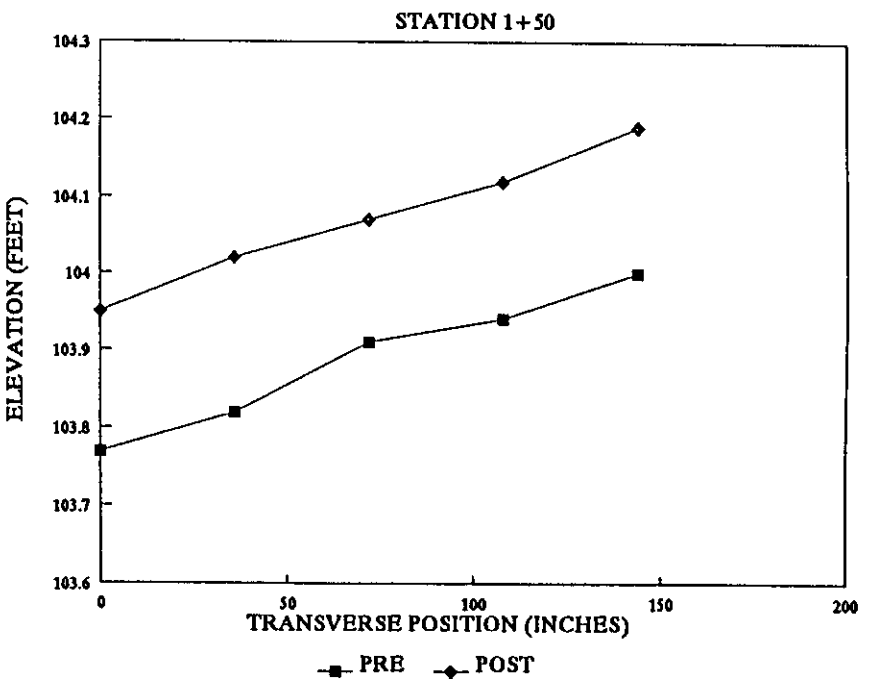
SECTION 48A502









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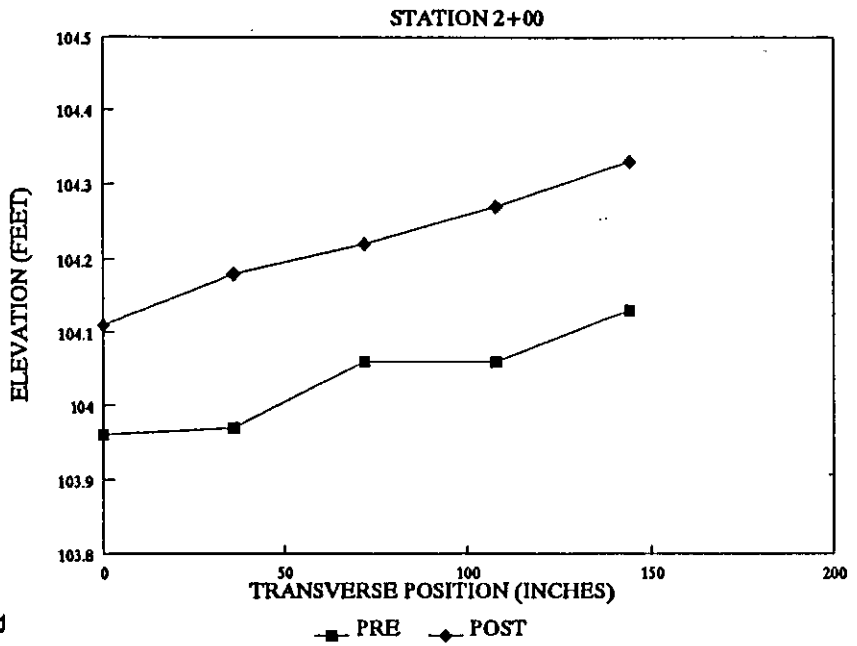

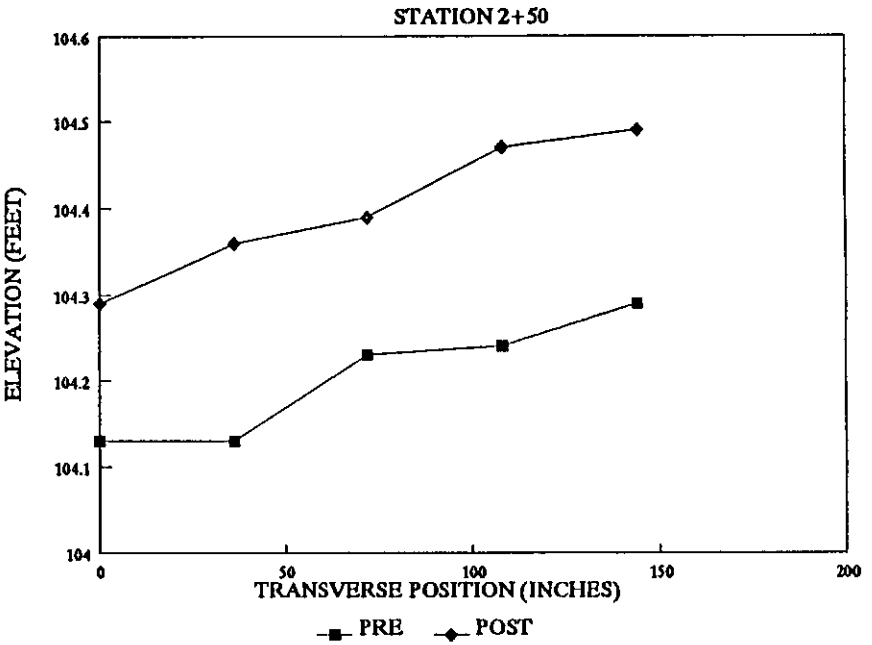

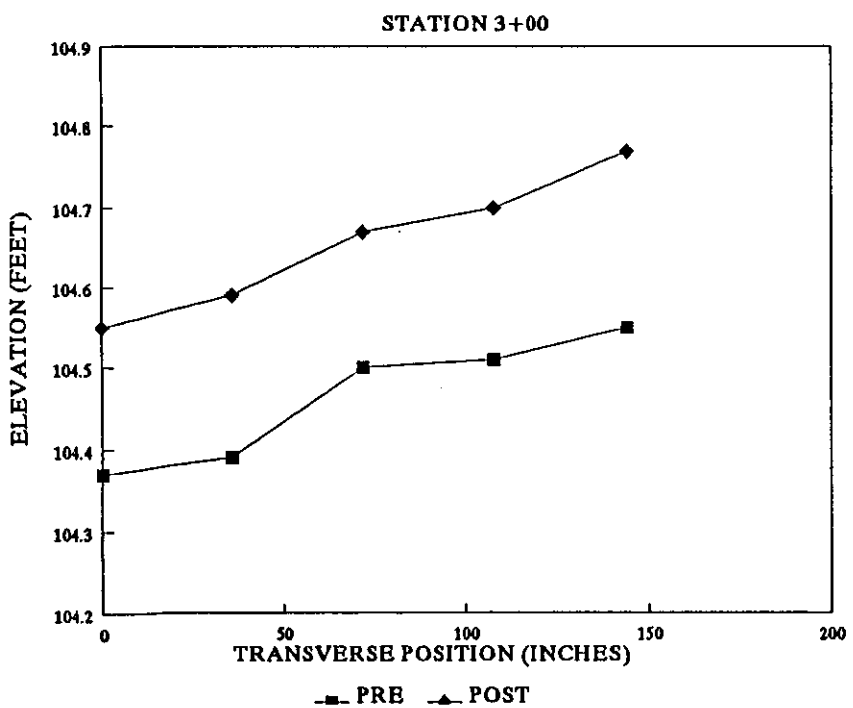

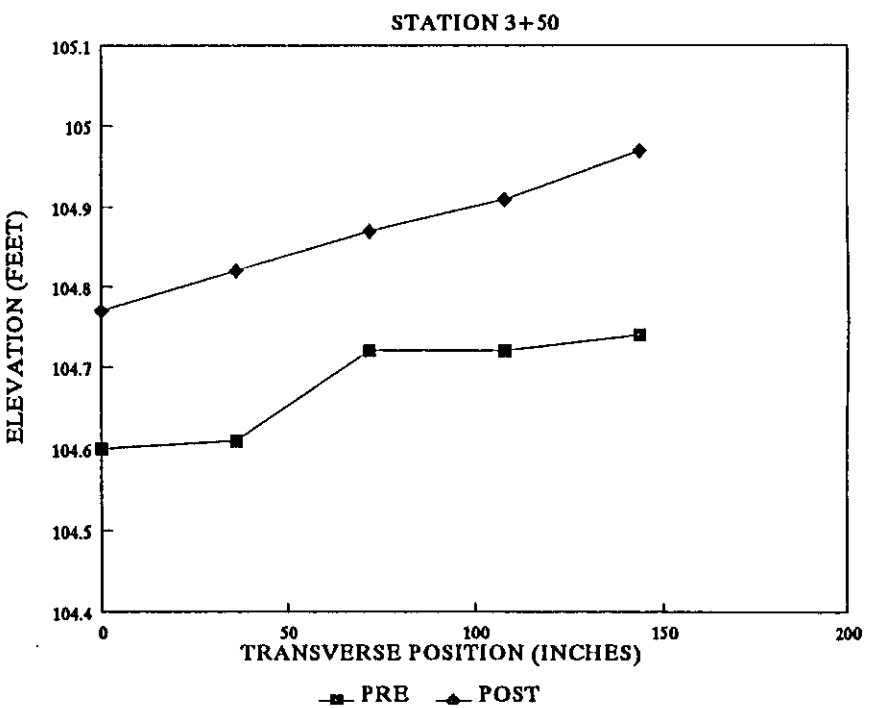

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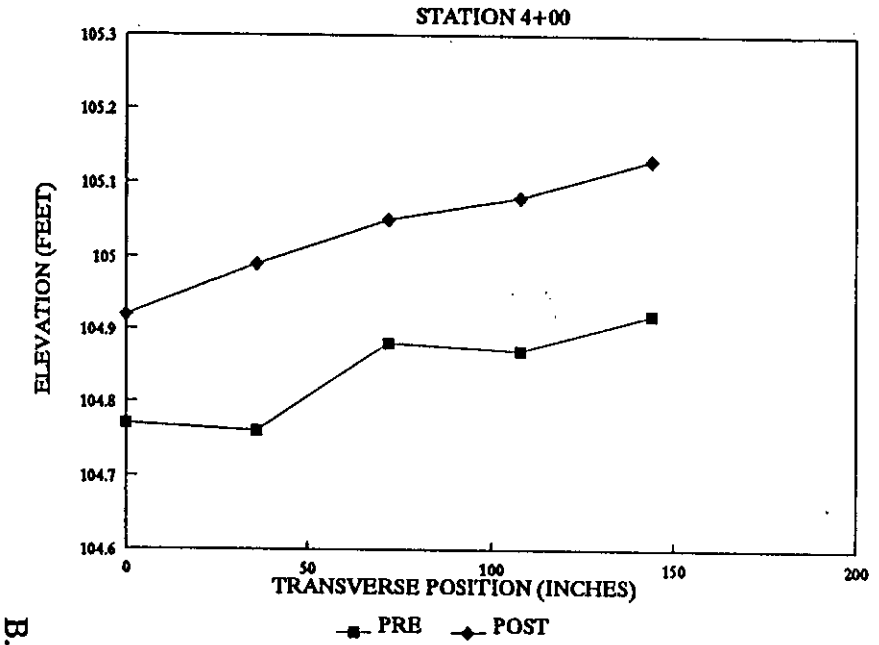

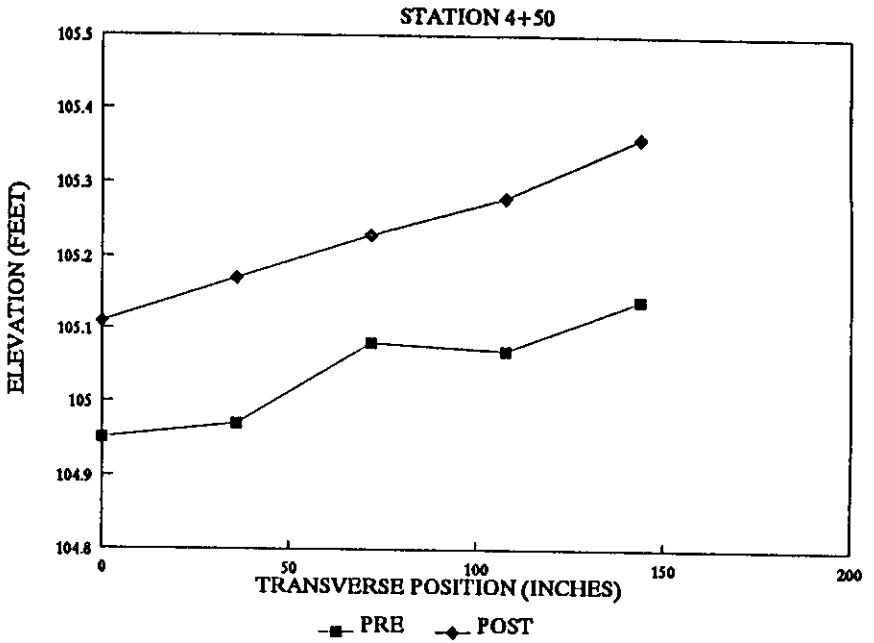

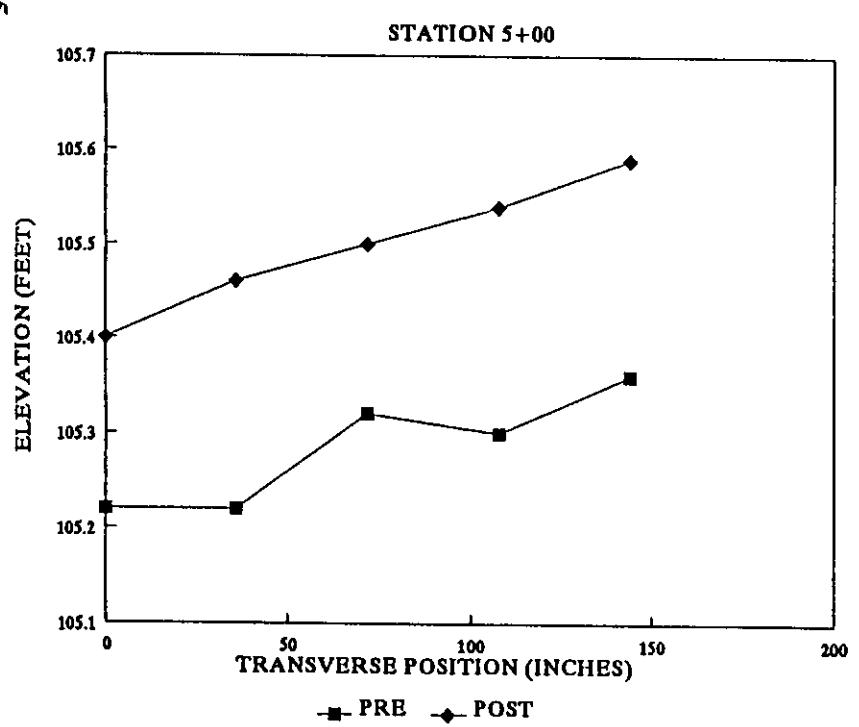

SECTION 48A503

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0+00	PRE	103.14	1.80	103.17	2.52	103.28	1.68	103.31	2.04	103.37	2.16
	POST	103.29		103.38		103.42		103.48		103.55	
0+50	PRE	103.35	2.04	103.40	2.64	103.50	2.16	103.54	2.52	103.61	2.40
	POST	103.52		103.62		103.68		103.75		103.81	
1+00	PRE	103.60	2.04	103.64	2.76	103.74	2.16	103.78	2.40	103.85	2.52
	POST	103.77		103.87		103.92		103.98		104.06	
1+50	PRE	103.77	2.16	103.82	2.40	103.91	1.92	103.94	2.16	104.00	2.28
	POST	103.95		104.02		104.07		104.12		104.19	
2+00	PRE	103.96	1.80	103.97	2.52	104.06	1.92	104.06	2.52	104.13	2.40
	POST	104.11		104.18		104.22		104.27		104.33	
2+50	PRE	104.13	1.92	104.13	2.76	104.23	1.92	104.24	2.76	104.29	2.40
	POST	104.29		104.36		104.39		104.47		104.49	
3+00	PRE	104.37	2.16	104.39	2.40	104.50	2.04	104.51	2.28	104.55	2.64
	POST	104.55		104.59		104.67		104.70		104.77	
3+50	PRE	104.60	2.04	104.61	2.52	104.72	1.80	104.72	2.28	104.74	2.76
	POST	104.77		104.82		104.87		104.91		104.97	
4+00	PRE	104.77	1.80	104.76	2.76	104.88	2.04	104.87	2.52	104.92	2.52
	POST	104.92		104.99		105.05		105.08		105.13	
4+50	PRE	104.95	1.92	104.97	2.40	105.08	1.80	105.07	2.52	105.14	2.64
	POST	105.11		105.17		105.23		105.28		105.36	
5+00	PRE	105.22	2.16	105.22	2.88	105.32	2.16	105.30	2.88	105.36	2.76
	POST	105.40		105.46		105.50		105.54		105.59	

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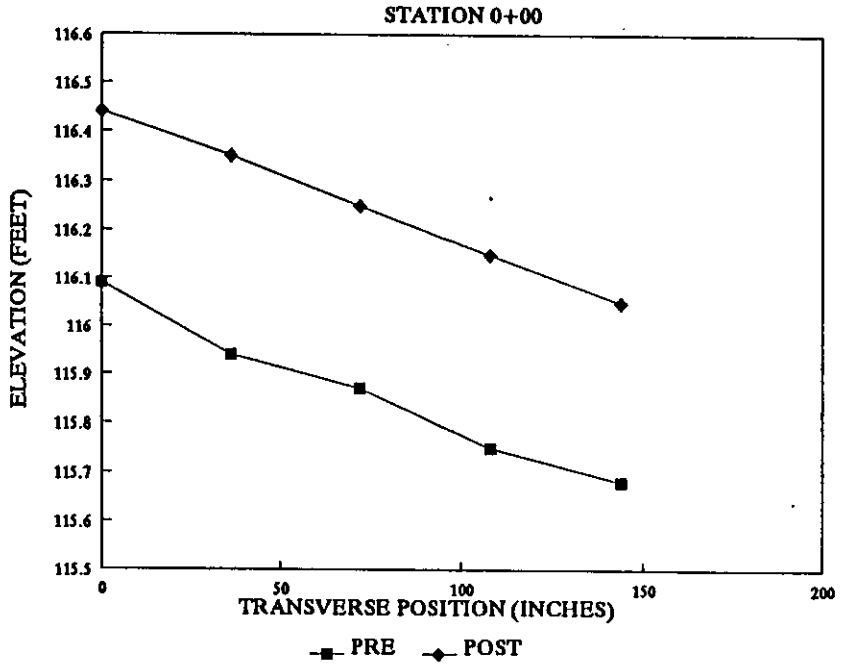
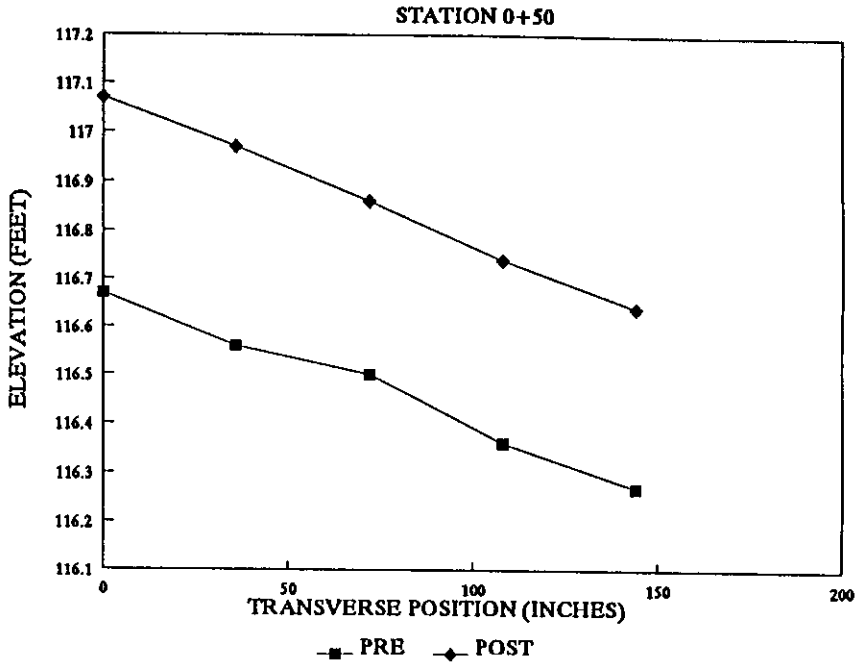
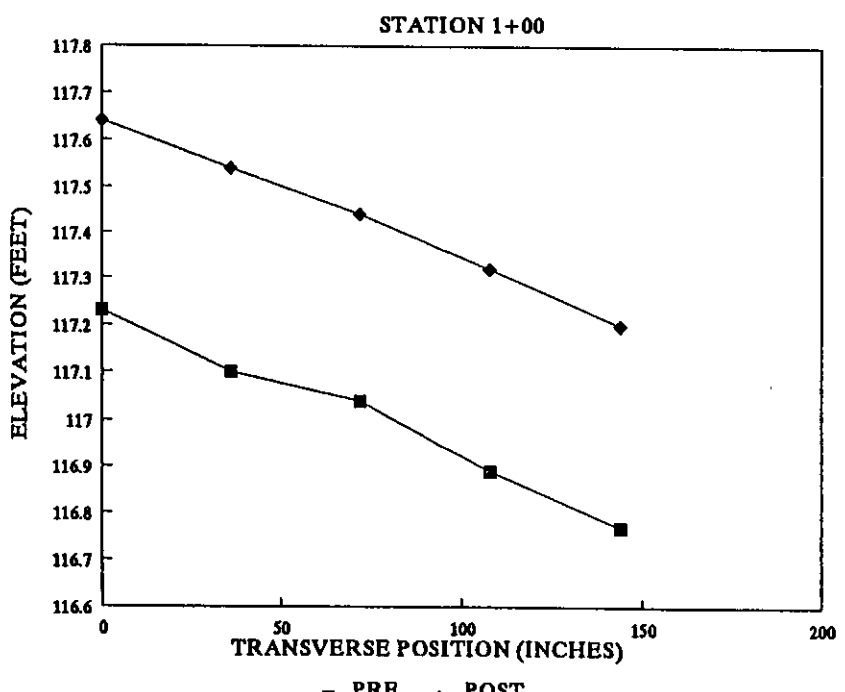
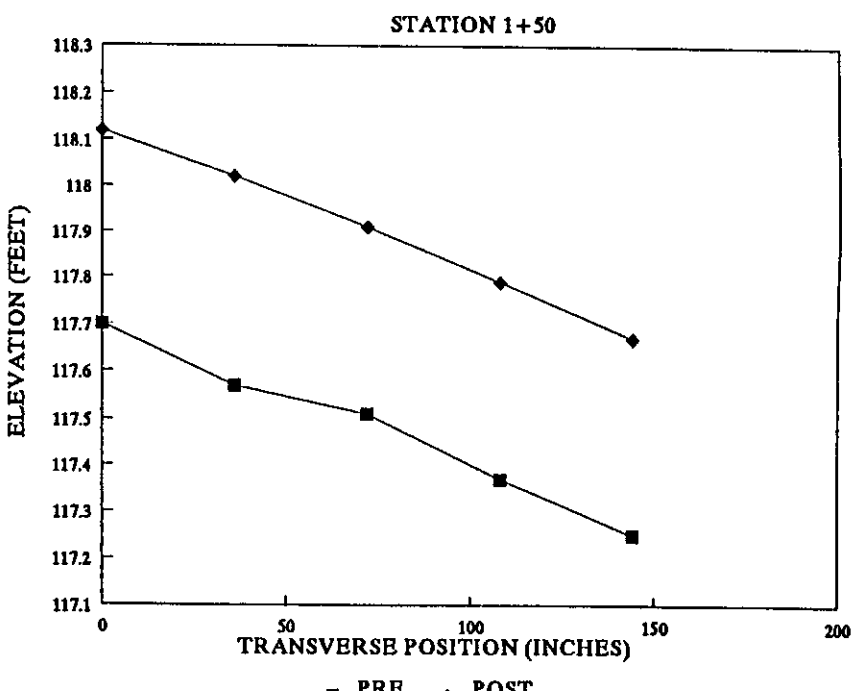
SECTION 48A503









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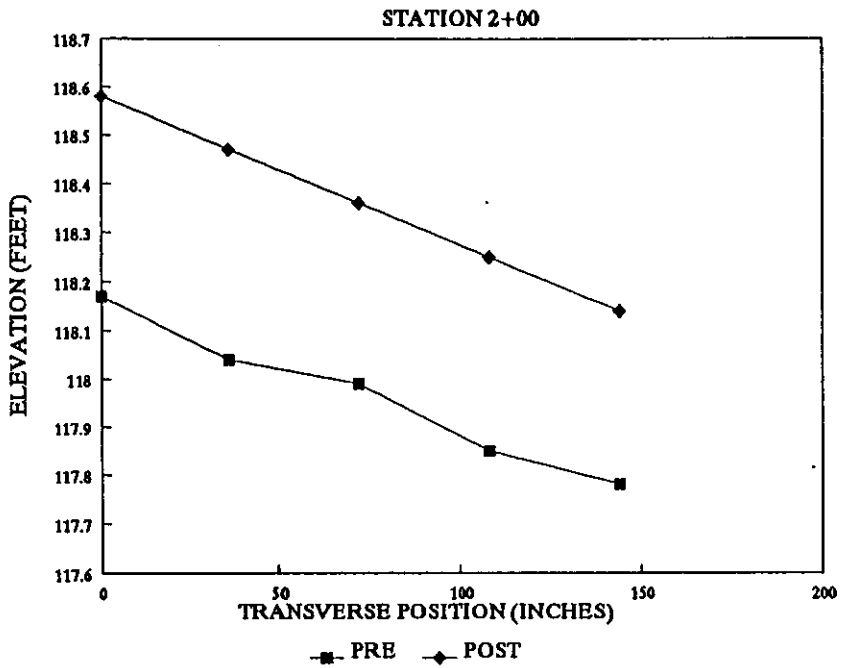

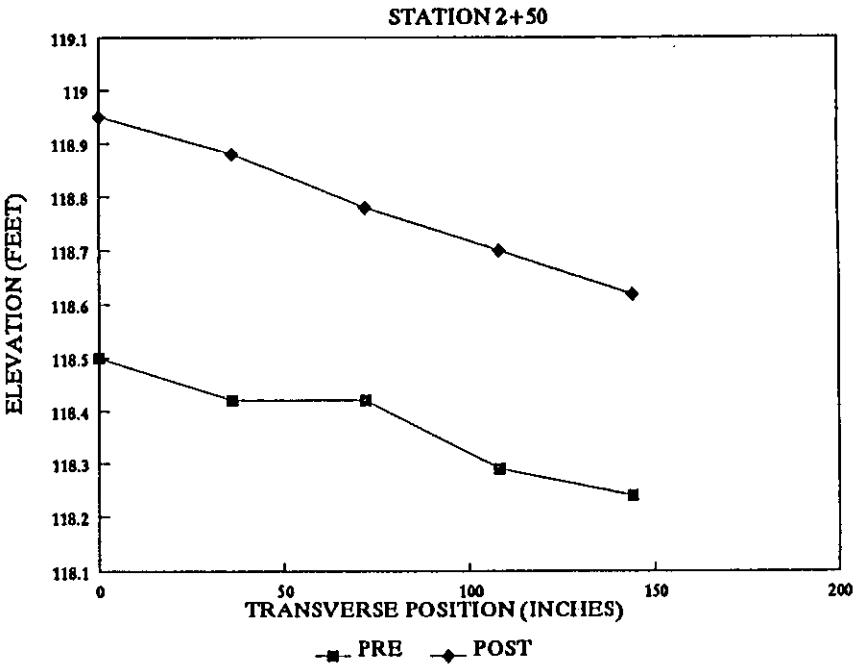

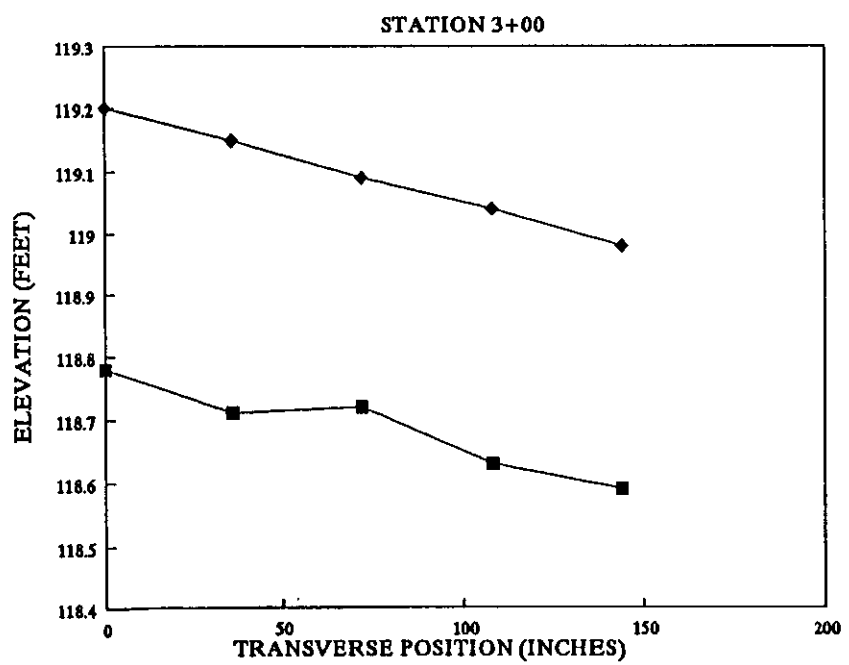

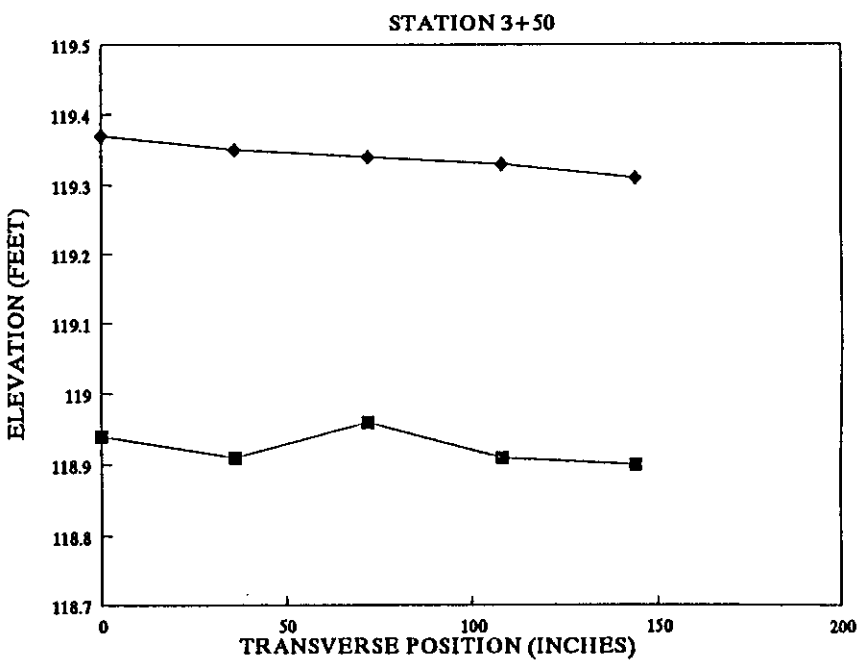

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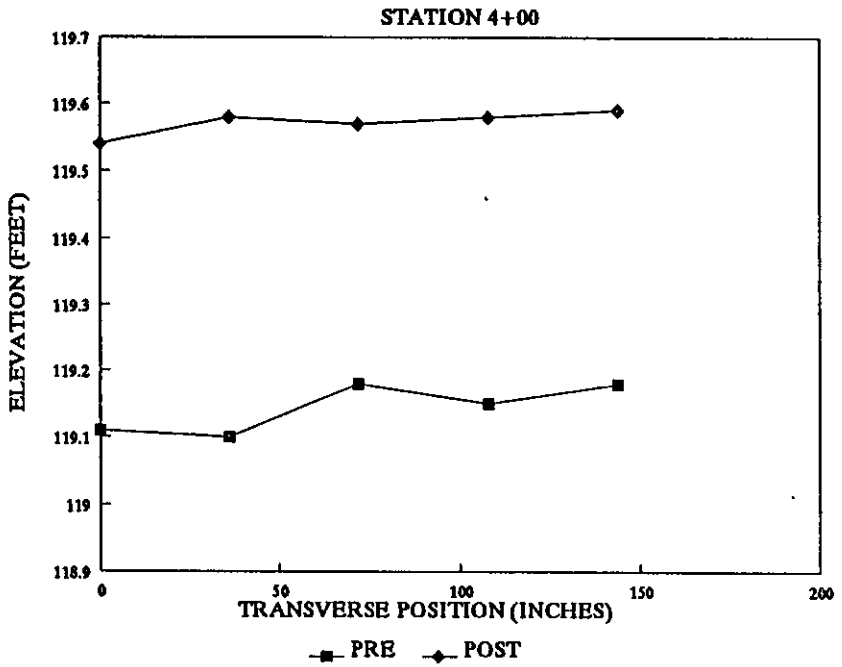

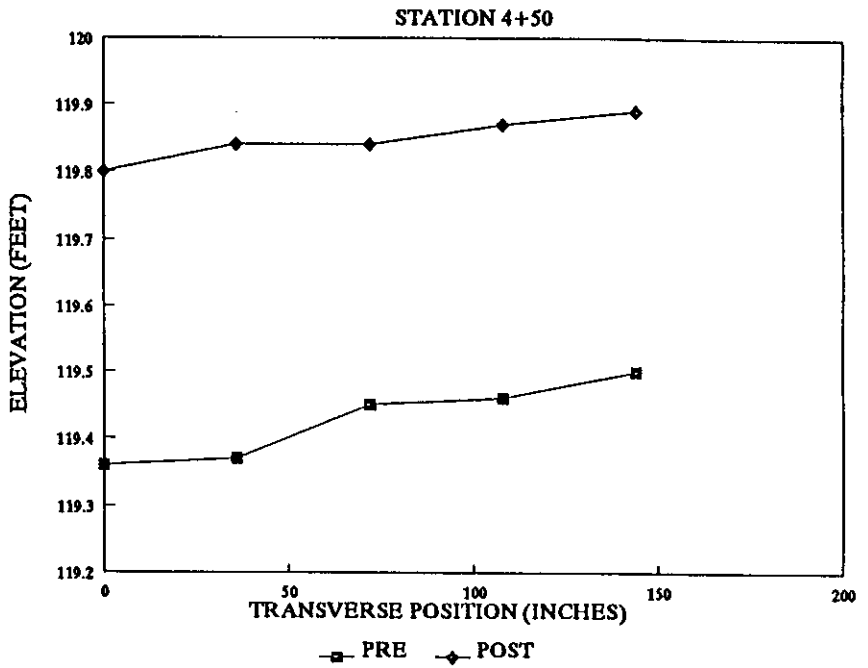

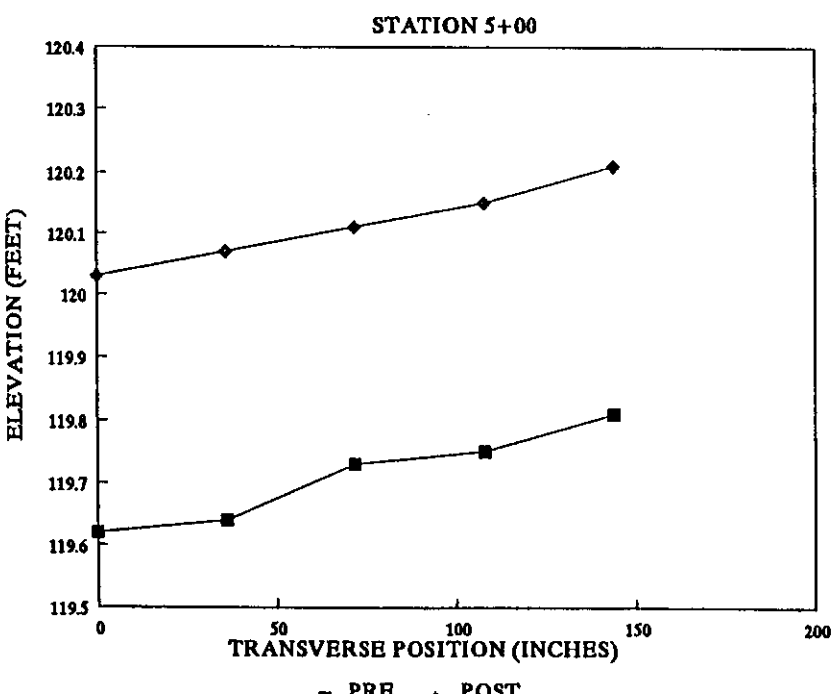

SECTION 48A504

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0+50	PRE	120.69	4.08	120.71	4.44	120.79	4.20	120.82	4.44	120.87	4.56
	POST	121.03		121.08		121.14		121.19		121.25	
1+00	PRE	120.77	4.92	120.80	5.40	120.90	4.56	120.91	4.92	120.97	4.68
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	POST	121.20		121.25		121.28		121.31		121.36	
2+00	PRE	120.77	4.92	120.77	5.40	120.89	4.44	120.89	4.92	120.92	5.04
	POST	121.18		121.22		121.26		121.30		121.34	
2+50	PRE	120.65	5.04	120.66	5.64	120.76	4.80	120.77	5.04	120.82	5.16
	POST	121.07		121.13		121.16		121.19		121.25	
3+00	PRE	120.53	5.16	120.57	5.16	120.65	4.68	120.66	4.92	120.70	4.92
	POST	120.96		121.00		121.04		121.07		121.11	
3+50	PRE	120.32	5.04	120.35	5.16	120.43	4.68	120.45	4.92	120.50	4.92
	POST	120.74		120.78		120.82		120.86		120.91	
4+00	PRE	120.02	5.40	120.08	5.28	120.16	4.80	120.20	4.80	120.24	4.92
	POST	120.47		120.52		120.56		120.60		120.65	
4+50	PRE	119.75	5.04	119.79	5.16	119.88	4.56	119.91	4.80	119.95	4.92
	POST	120.17		120.22		120.26		120.31		120.36	
5+00	PRE	119.47	4.92	119.53	4.80	119.63	4.08	119.65	4.32	119.68	4.68
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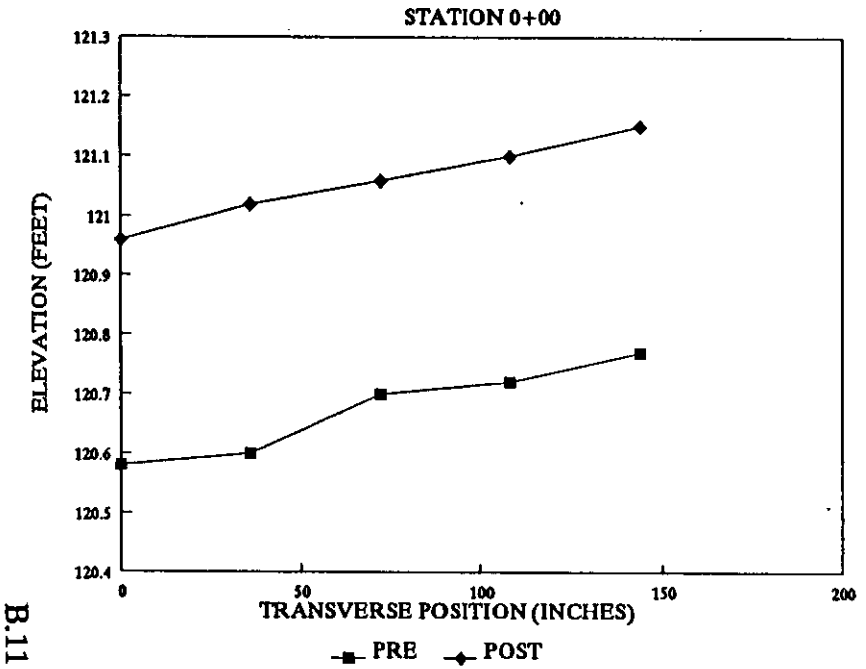

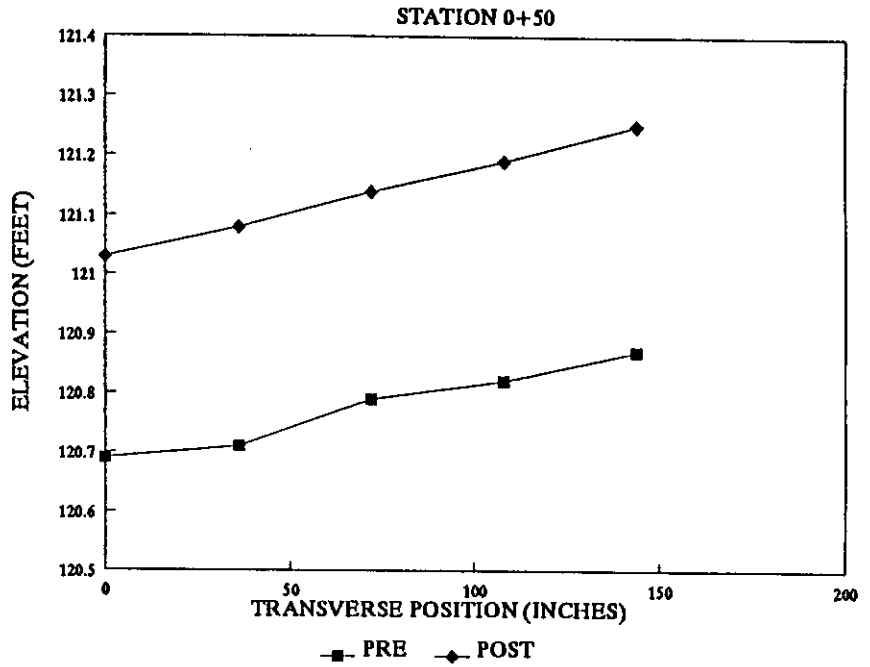

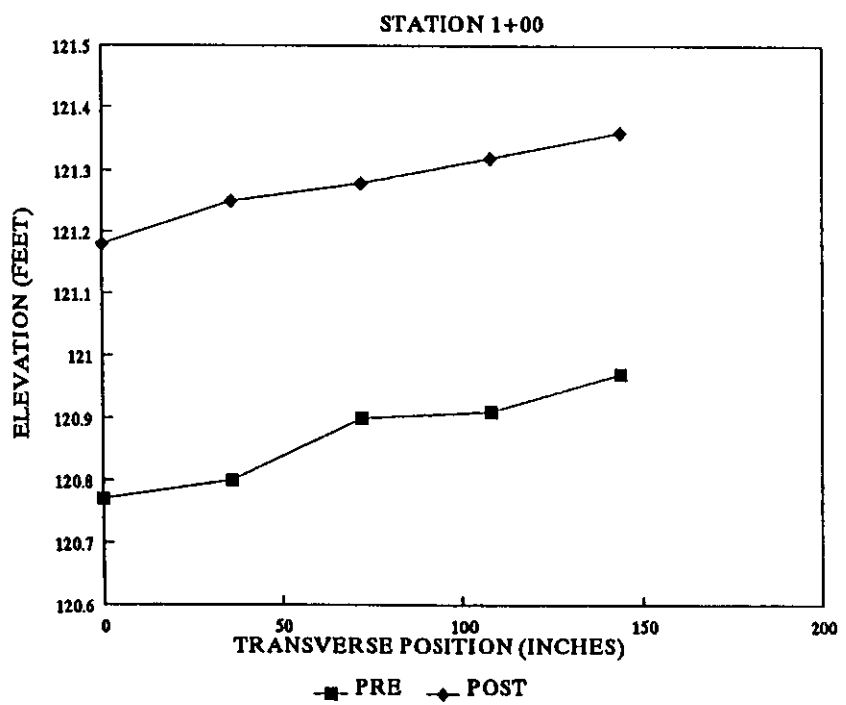

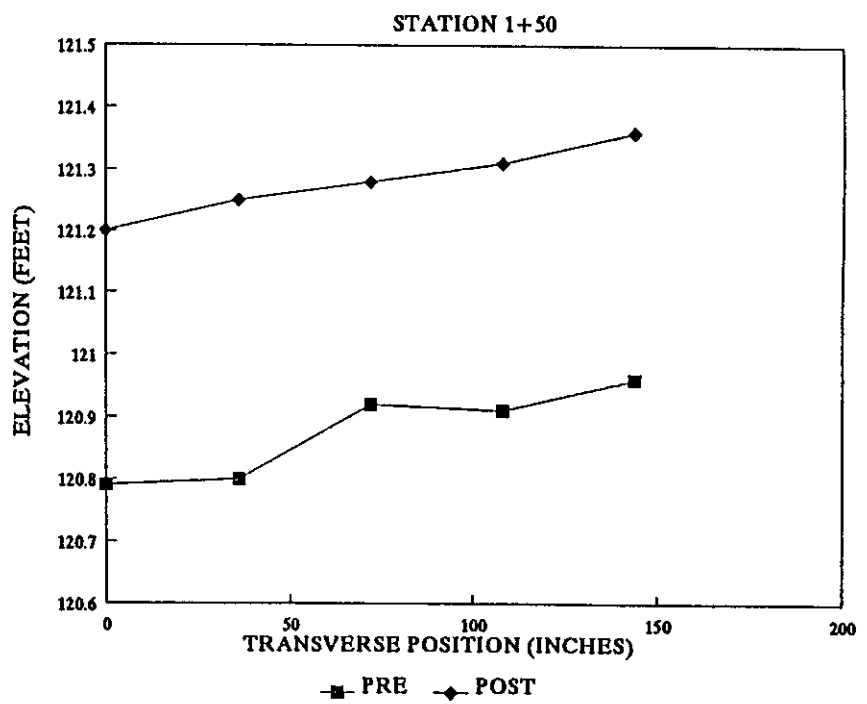

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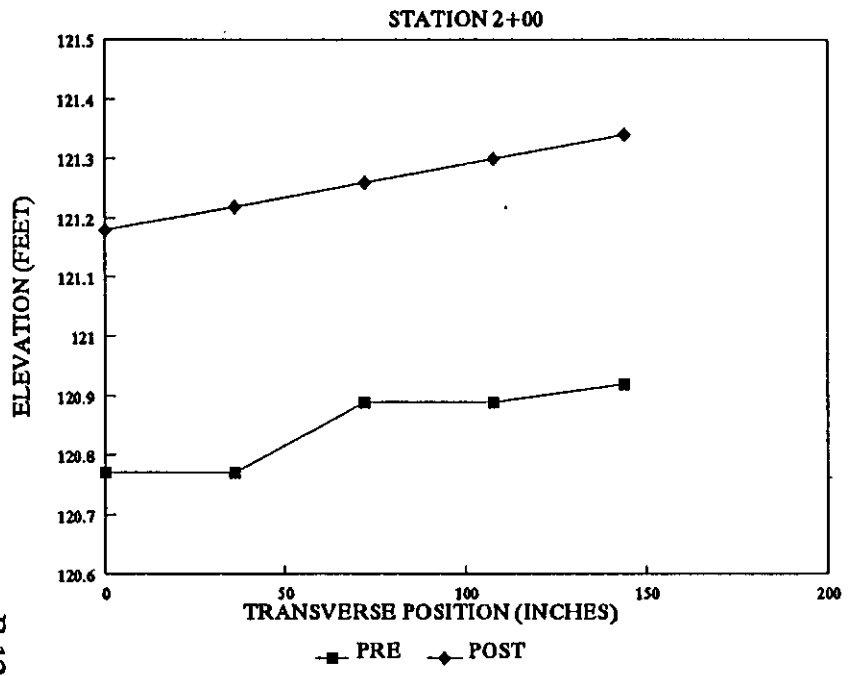

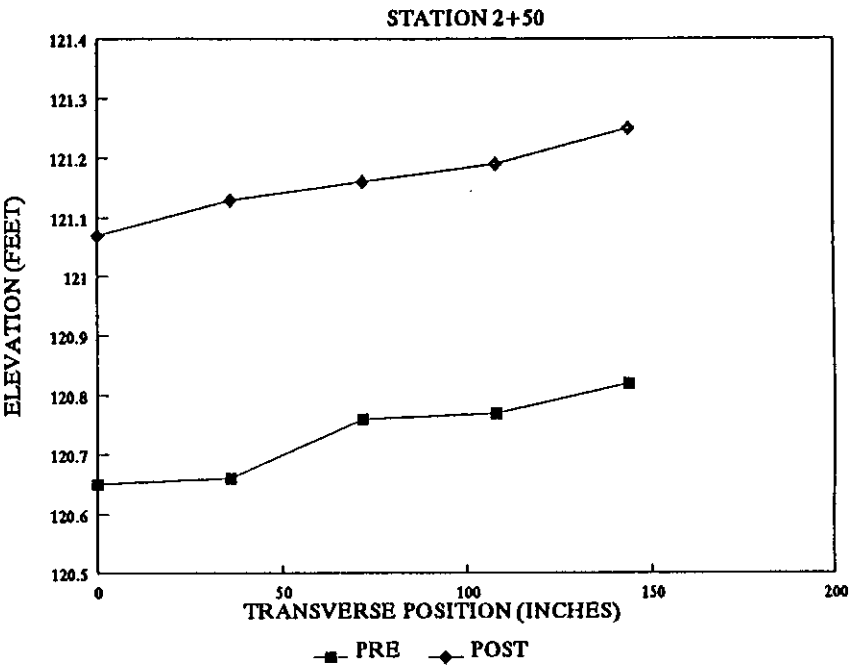

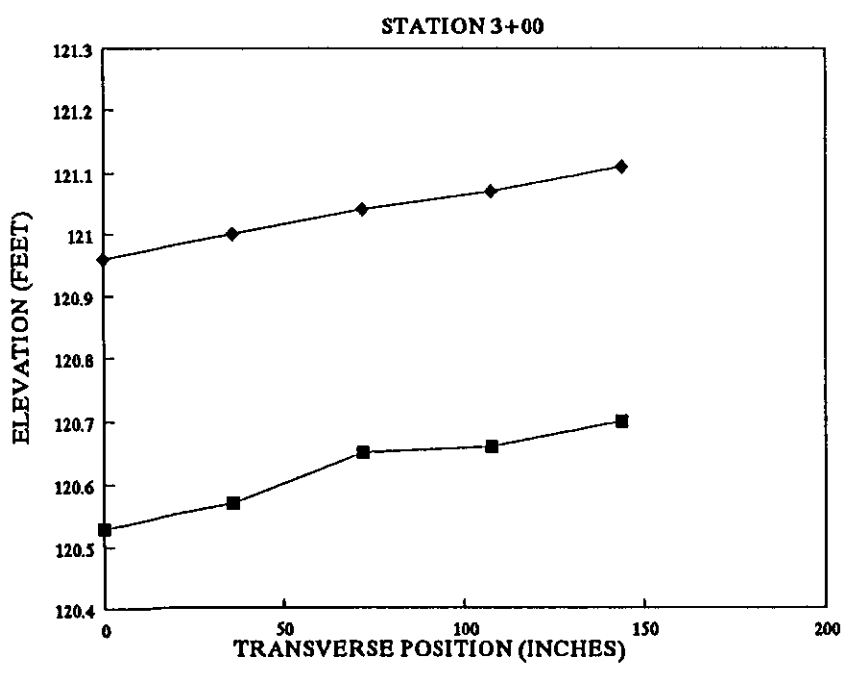

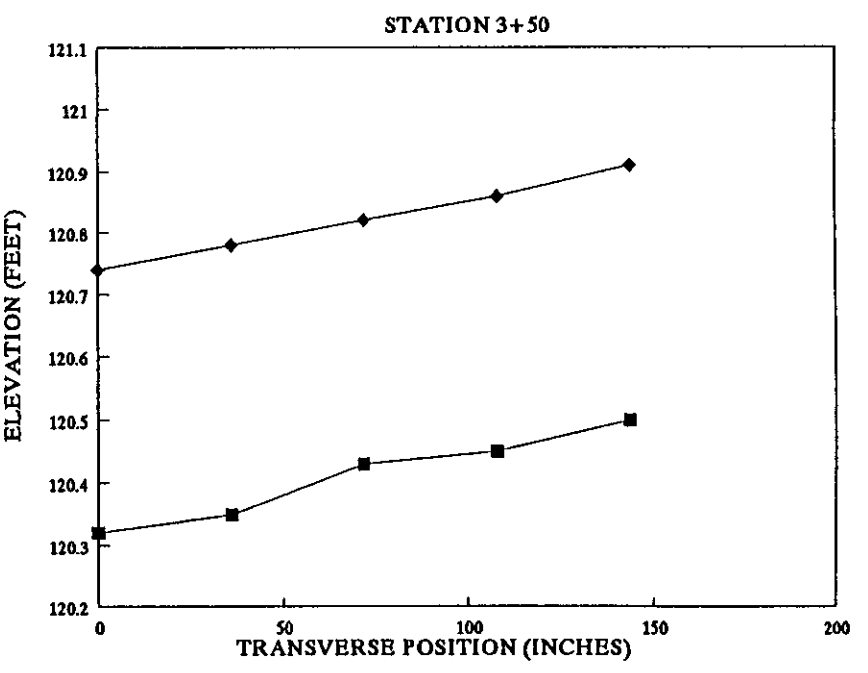

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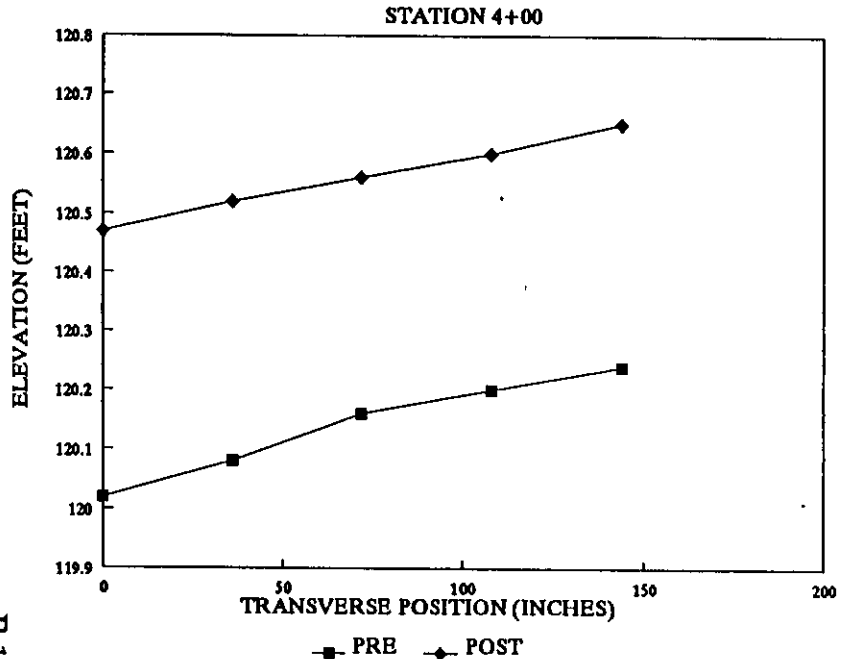

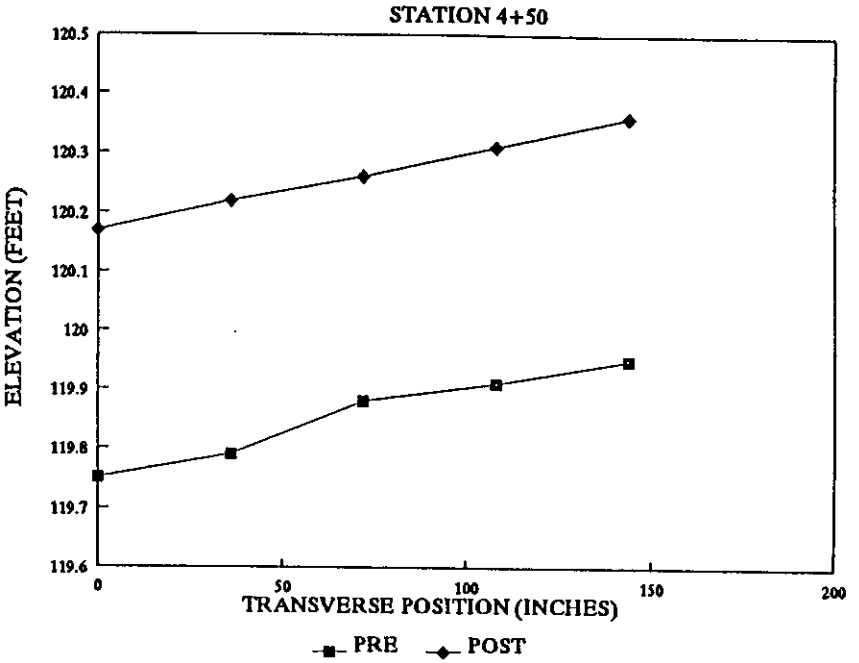

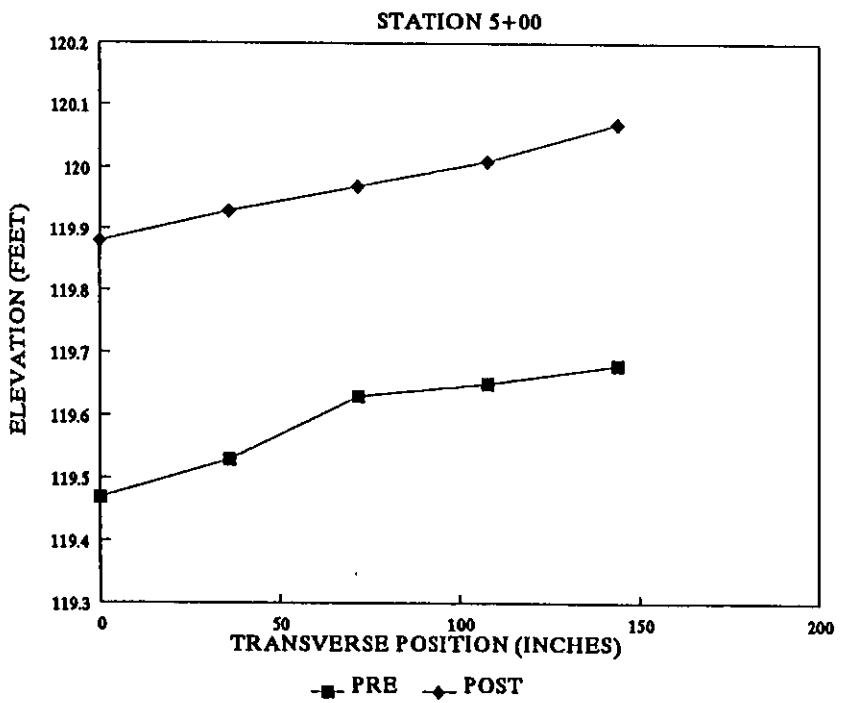

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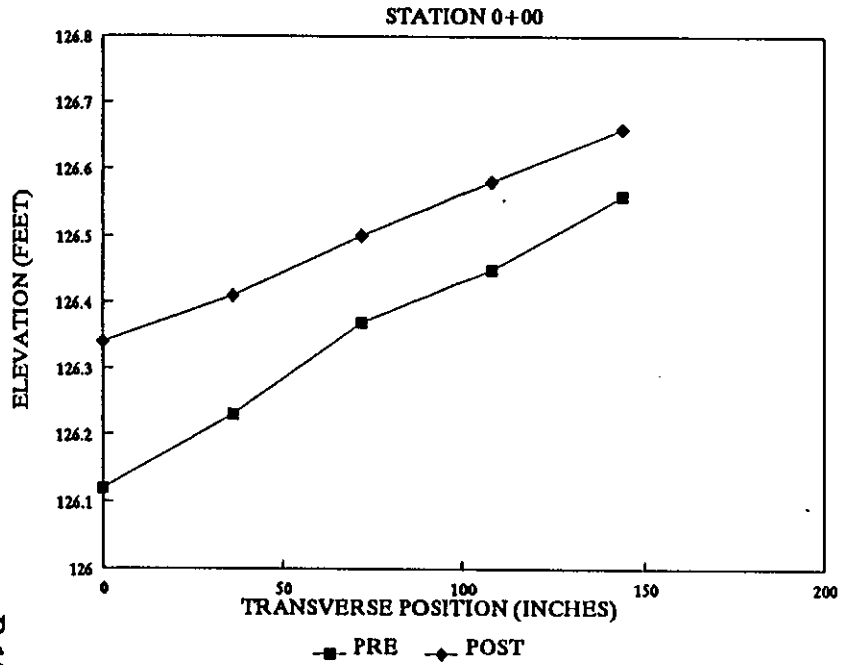
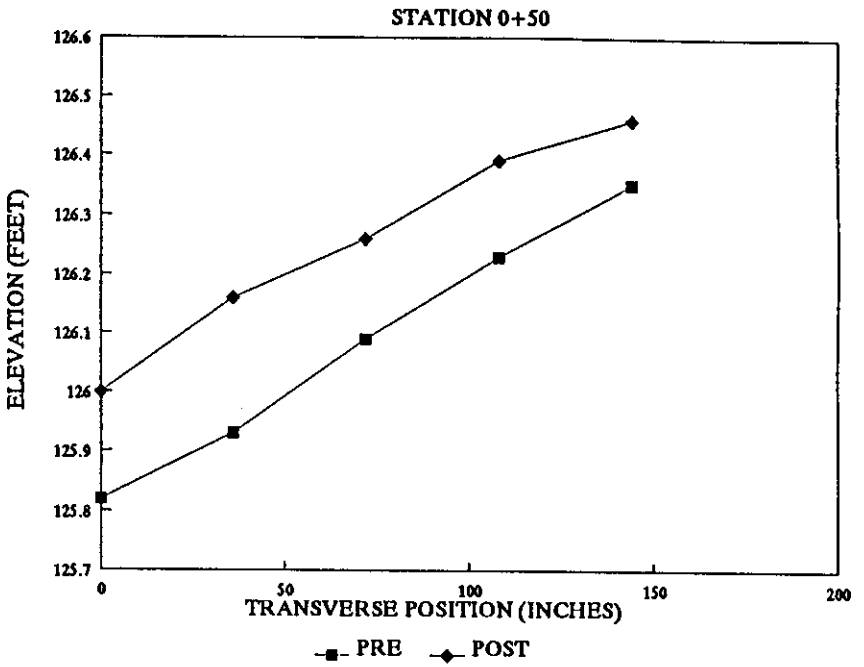
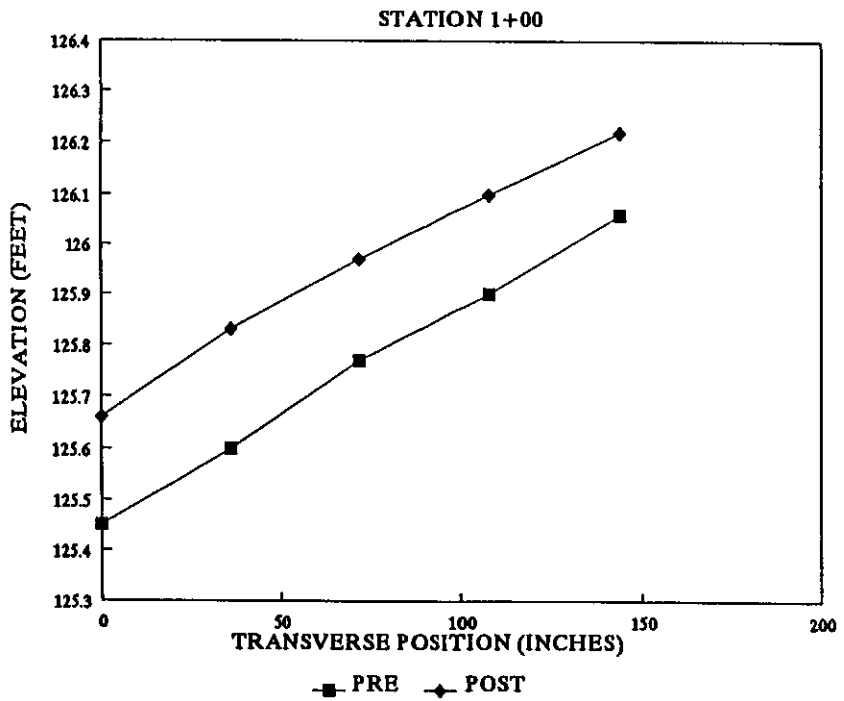
	POST	126.34		126.41		126.50		126.58		126.66	
0+50	PRE	125.82	2.16	125.93	2.76	126.09	2.04	126.23	1.92	126.35	1.32
	POST	126.00		126.16		126.26		126.39		126.46	
1+00	PRE	125.45	2.52	125.60	2.76	125.77	2.40	125.90	2.40	126.06	1.92
	POST	125.66		125.83		125.97		126.10		126.22	
1+50	PRE	125.14	2.76	125.31	3.00	125.48	2.52	125.63	2.64	125.77	2.52
	POST	125.37		125.56		125.69		125.85		125.98	
2+00	PRE	124.84	2.64	124.97	3.12	125.16	2.40	125.32	2.28	125.46	2.40
	POST	125.06		125.23		125.36		125.51		125.66	
2+50	PRE	124.56	2.40	124.70	2.76	124.90	2.28	125.03	2.64	125.19	2.76
	POST	124.76		124.93		125.09		125.25		125.42	
3+00	PRE	124.22	2.40	124.39	2.40	124.58	2.04	124.71	1.80	124.86	2.04
	POST	124.42		124.59		124.75		124.86		125.03	
3+50	PRE	123.95	2.52	124.07	2.88	124.27	2.28	124.40	2.40	124.55	2.64
	POST	124.16		124.31		124.46		124.60		124.77	
4+00	PRE	123.68	2.28	123.86	2.28	124.03	1.92	124.16	2.16	124.29	2.52
	POST	123.87		124.05		124.19		124.34		124.50	
4+50	PRE	123.50	2.40	123.63	2.88	123.82	2.28	123.95	2.52	124.11	2.52
	POST	123.70		123.87		124.01		124.16		124.32	
5+00	PRE	123.32	2.28	123.47	2.28	123.66	1.80	123.81	2.28	123.94	2.64
	POST	123.51		123.66		123.81		124.00		124.16	

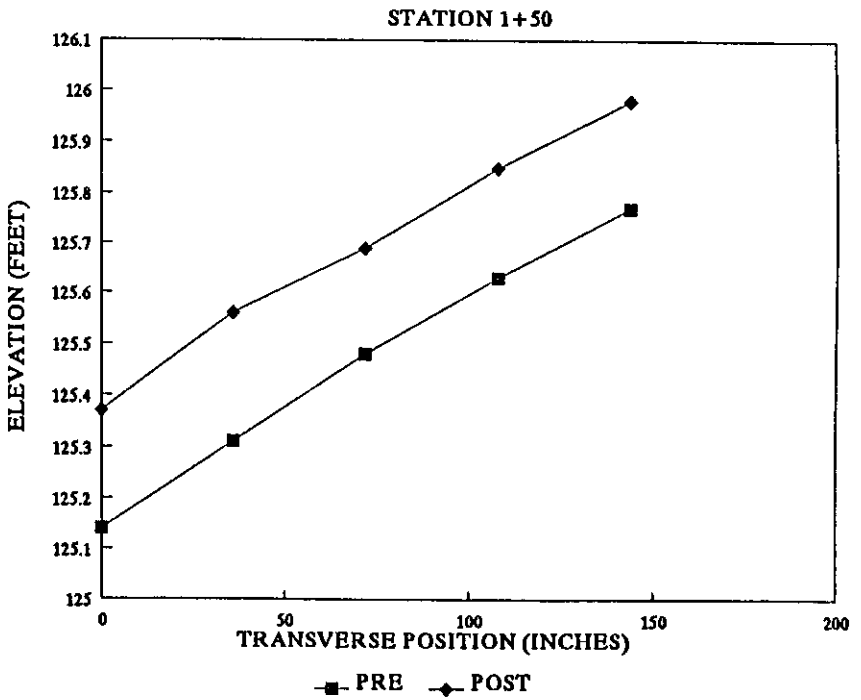
48a500.wk3

SECTION 48A505

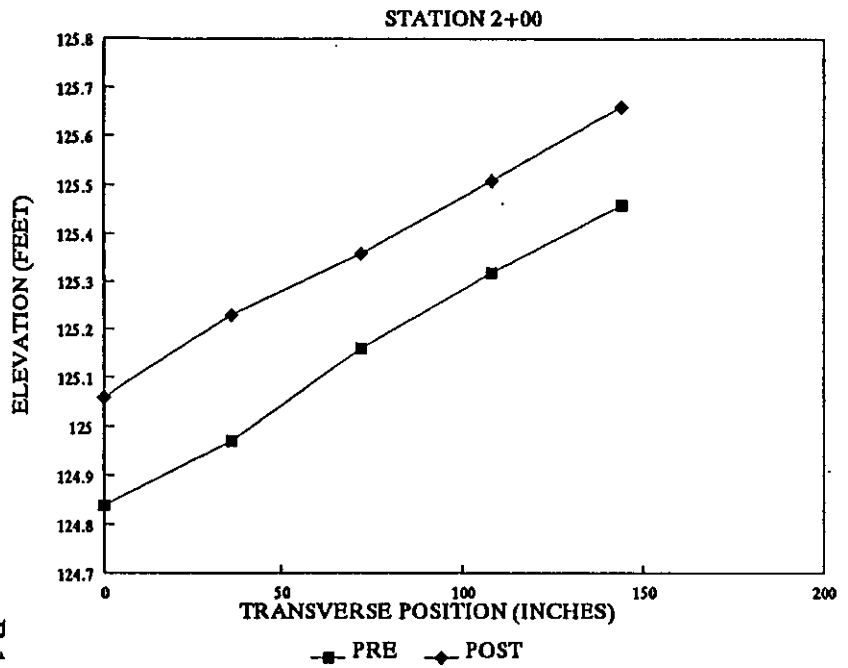


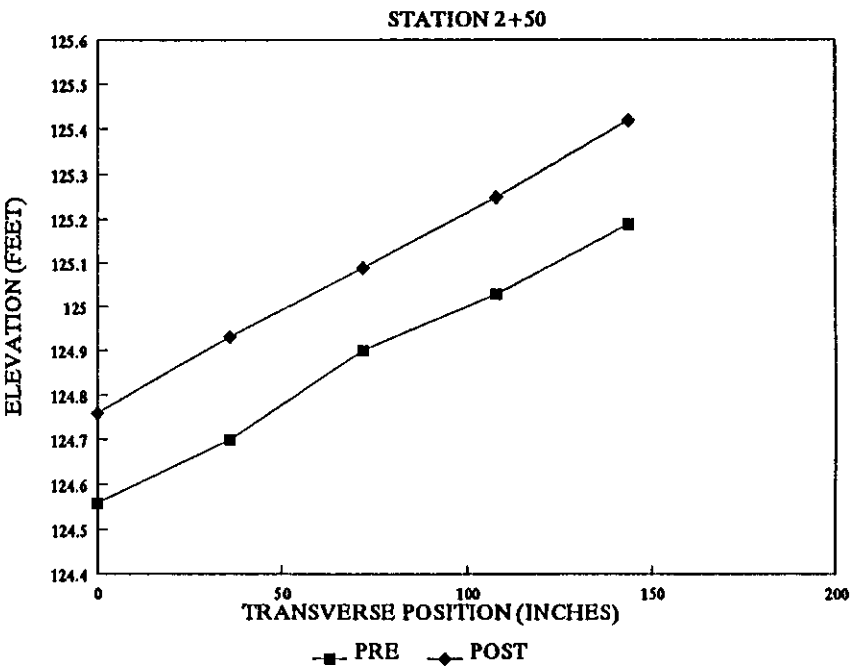


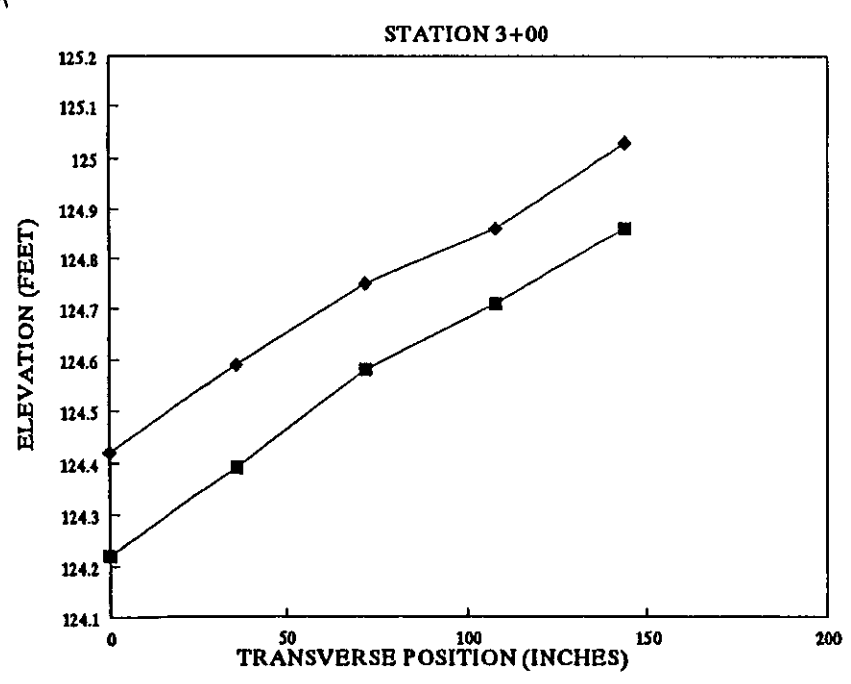


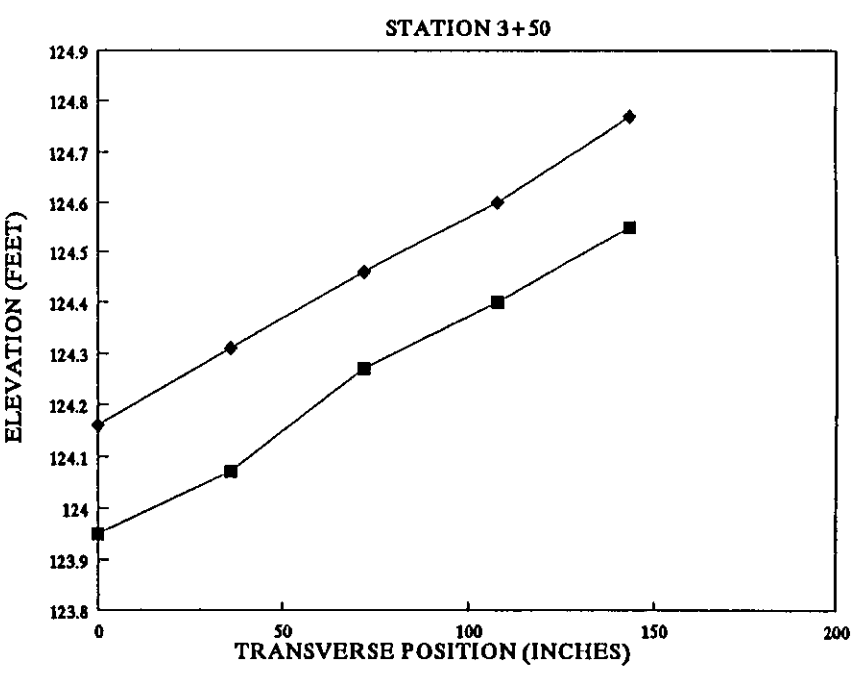


SECTION 48A505

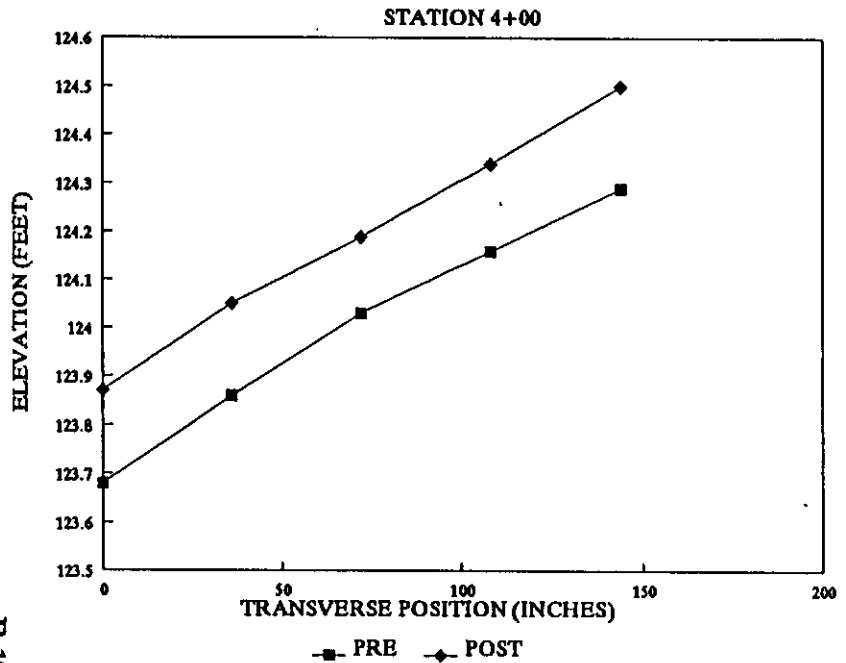


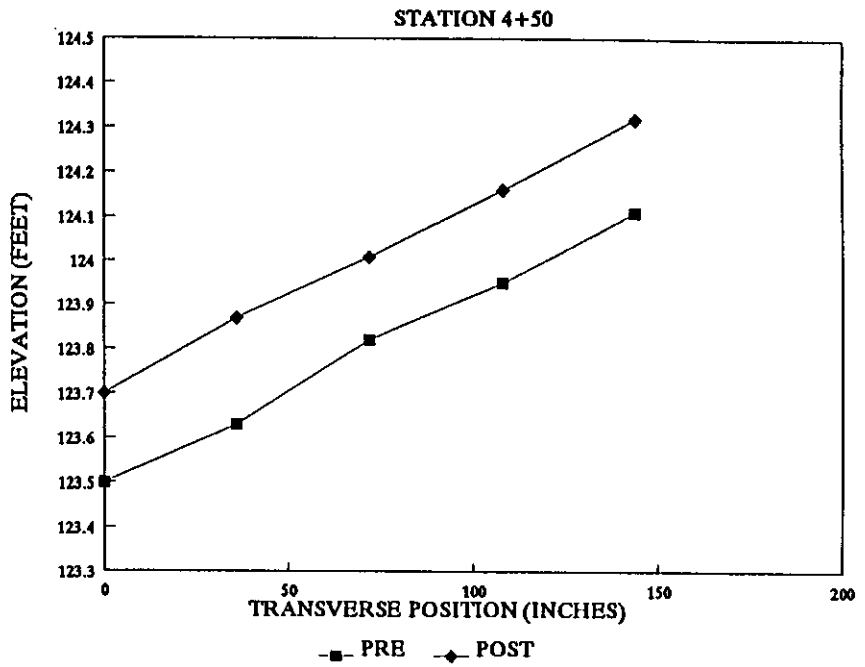


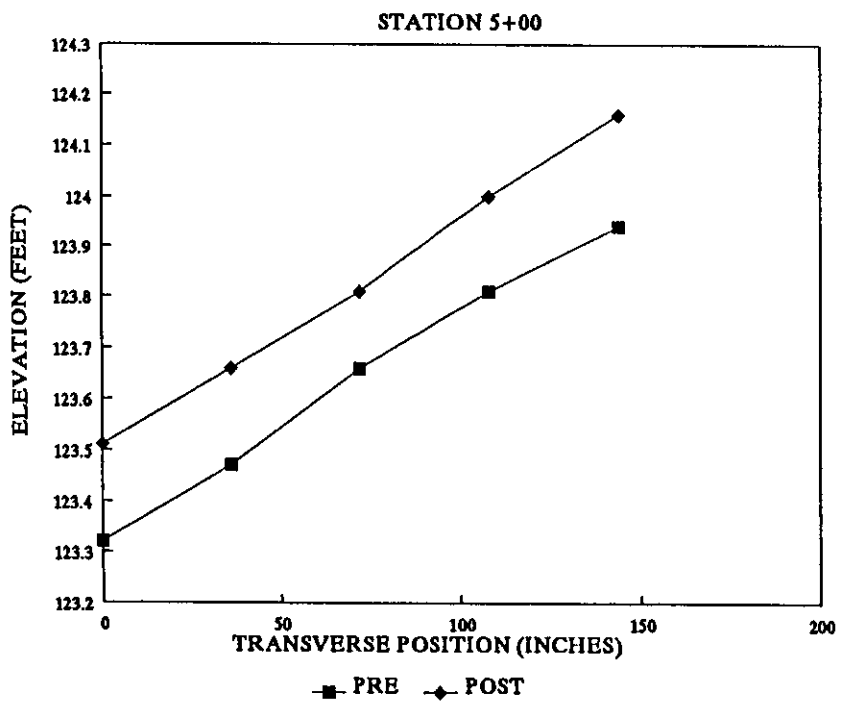




SECTION 48A505





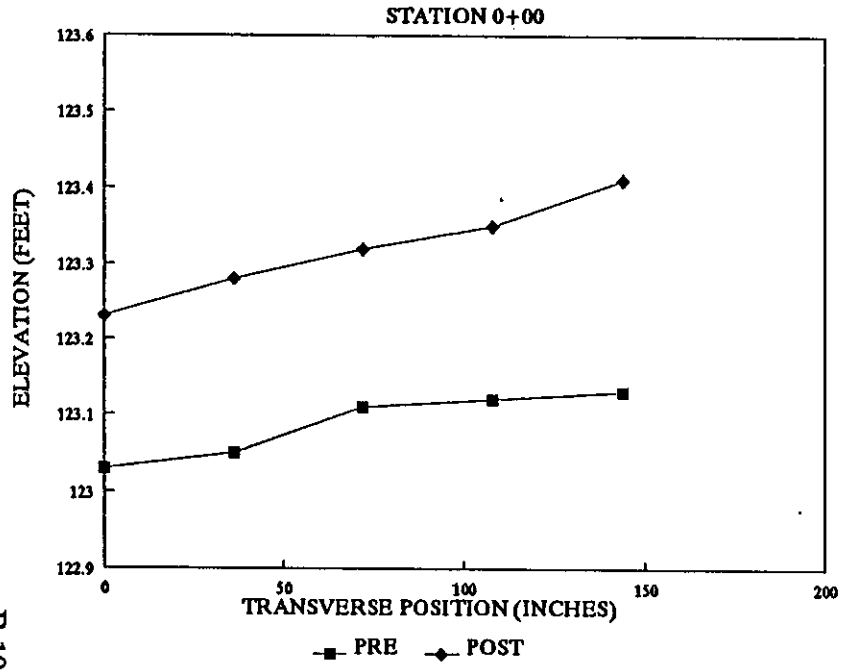


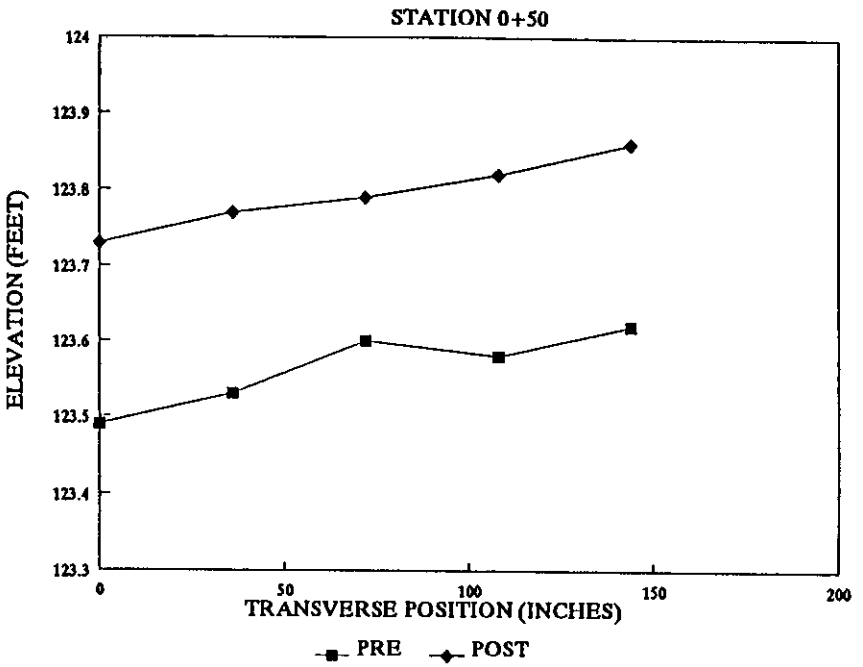
SECTION 48A506

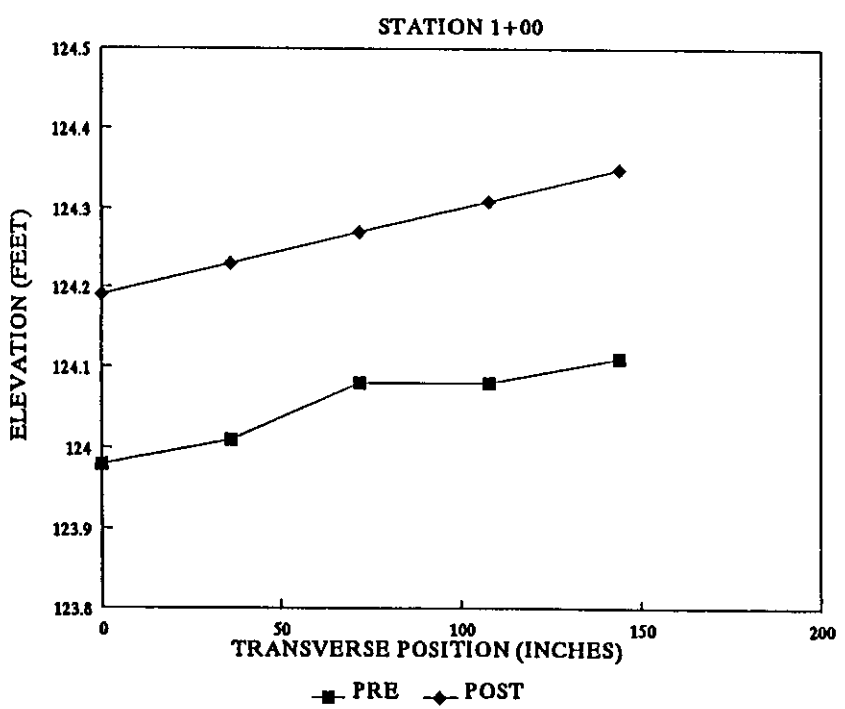
Trans. Offset		0'	Overlay Depth (IN.)	3'	Overlay Depth (IN.)	6'	Overlay Depth (IN.)	9'	Overlay Depth (IN.)	12'	Overlay Depth (IN.)
0+00	PRE	123.03	2.40	123.05	2.76	123.11	2.52	123.12	2.76	123.13	3.36
	POST	123.23		123.28		123.32		123.35		123.41	
0+50	PRE	123.49	2.88	123.53	2.88	123.60	2.28	123.58	2.88	123.62	2.88
	POST	123.73		123.77		123.79		123.82		123.86	
1+00	PRE	123.98	2.52	124.01	2.64	124.08	2.28	124.08	2.76	124.11	2.88
	POST	124.19		124.23		124.27		124.31		124.35	
1+50	PRE	124.43	2.64	124.46	3.00	124.52	2.76	124.53	3.12	124.59	2.88
	POST	124.65		124.71		124.75		124.79		124.83	
2+00	PRE	124.86	3.00	124.89	3.12	124.97	2.52	124.97	2.88	125.01	3.00
	POST	125.11		125.15		125.18		125.21		125.26	
2+50	PRE	125.23	2.64	125.27	3.00	125.36	2.28	125.37	2.88	125.41	3.00
	POST	125.45		125.52		125.55		125.61		125.66	
3+00	PRE	125.59	2.76	125.63	3.00	125.72	2.40	125.73	2.64	125.78	2.88
	POST	125.82		125.88		125.92		125.95		126.02	
3+50	PRE	125.93	2.88	125.98	2.88	126.06	2.40	126.08	2.52	126.13	2.40
	POST	126.17		126.22		126.26		126.29		126.33	
4+00	PRE	126.25	2.52	126.28	2.88	126.37	2.16	126.37	2.64	126.42	2.52
	POST	126.46		126.52		126.55		126.59		126.63	
4+50	PRE	126.48	3.00	126.50	3.24	126.58	2.52	126.56	3.00	126.60	2.76
	POST	126.73		126.77		126.79		126.81		126.83	
5+00	PRE	126.51	2.76	126.54	2.88	126.61	2.40	126.66	2.04	126.69	2.04
	POST	126.74		126.78		126.81		126.83		126.86	

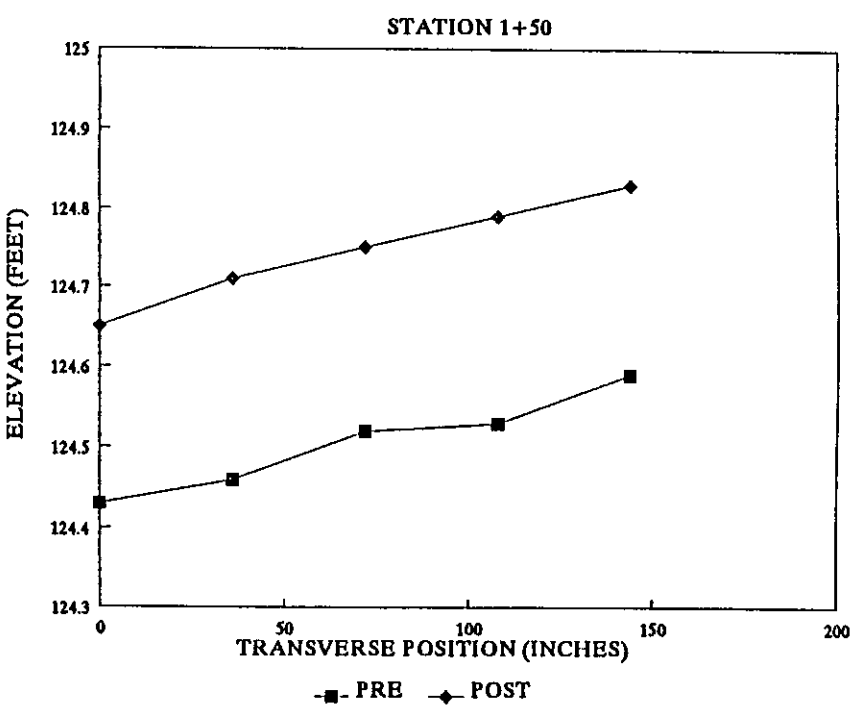
48a500.wk3

SECTION 48A506

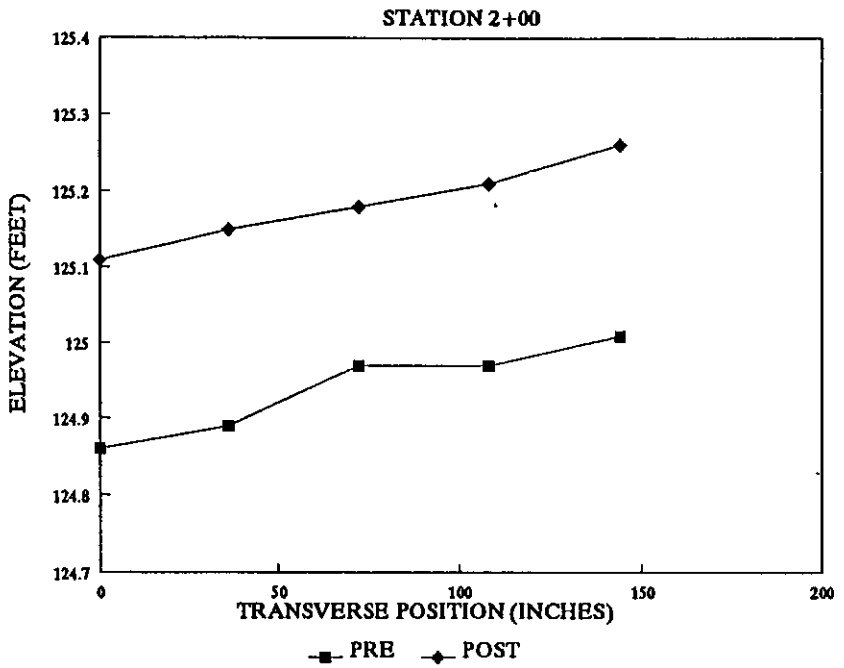


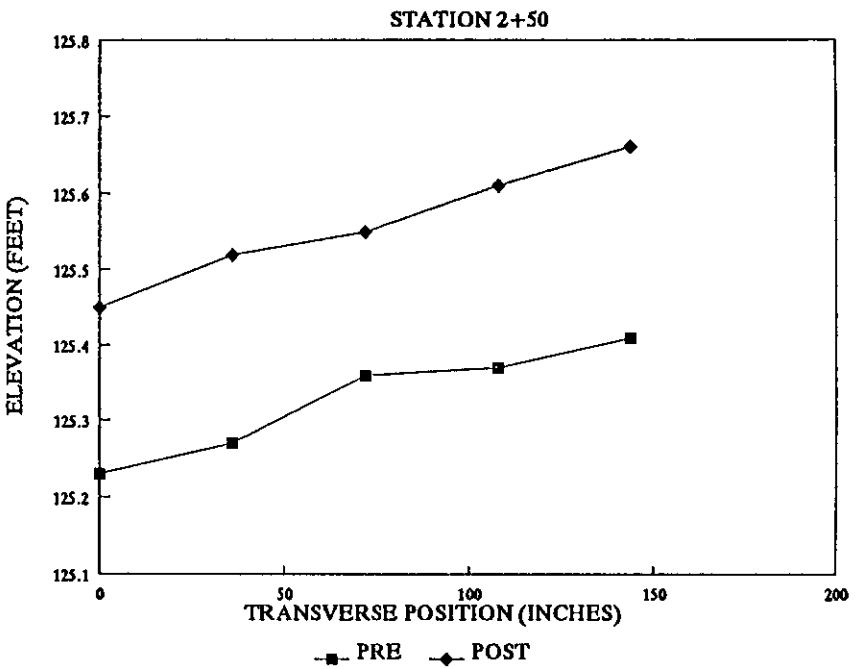


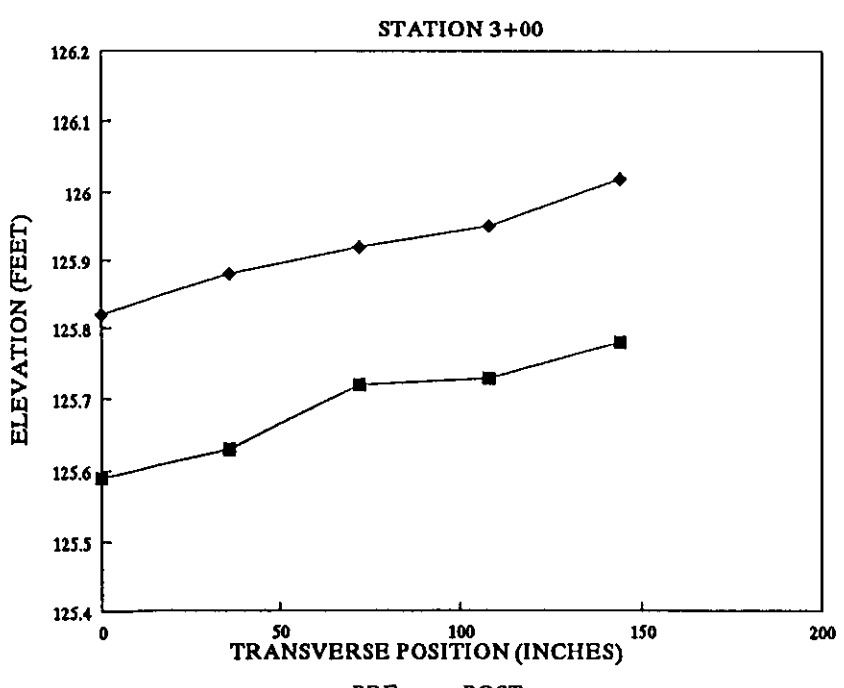


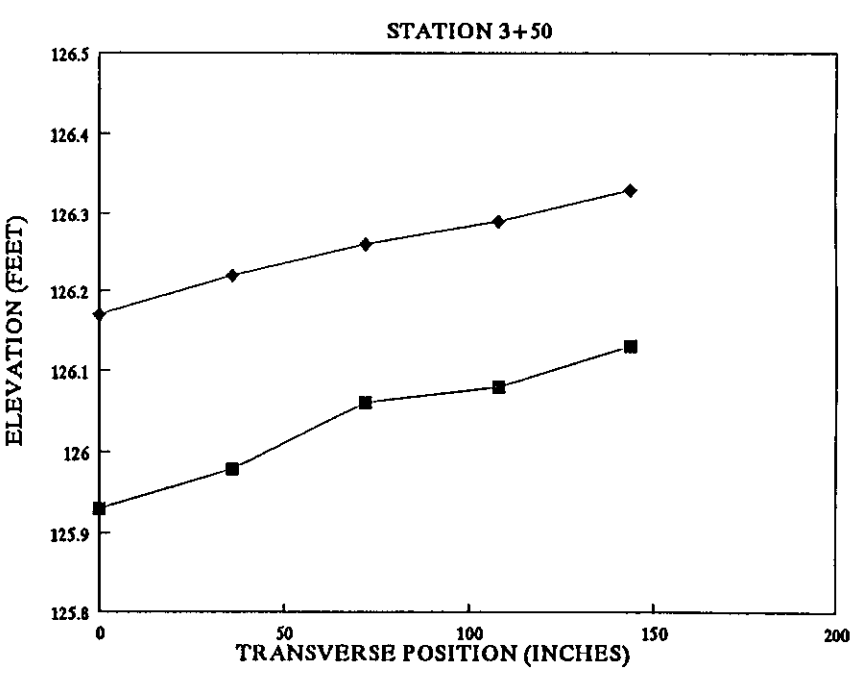


SECTION 48A506

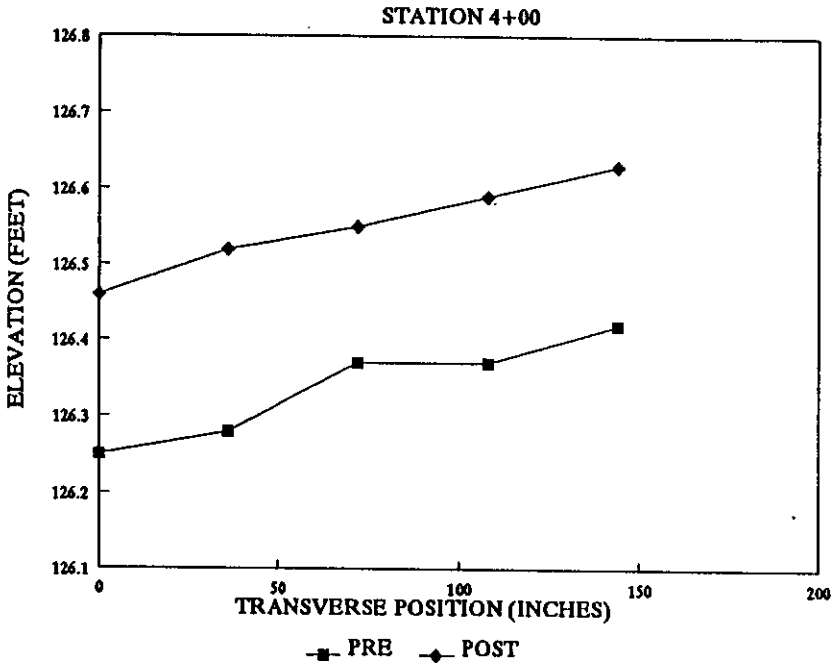


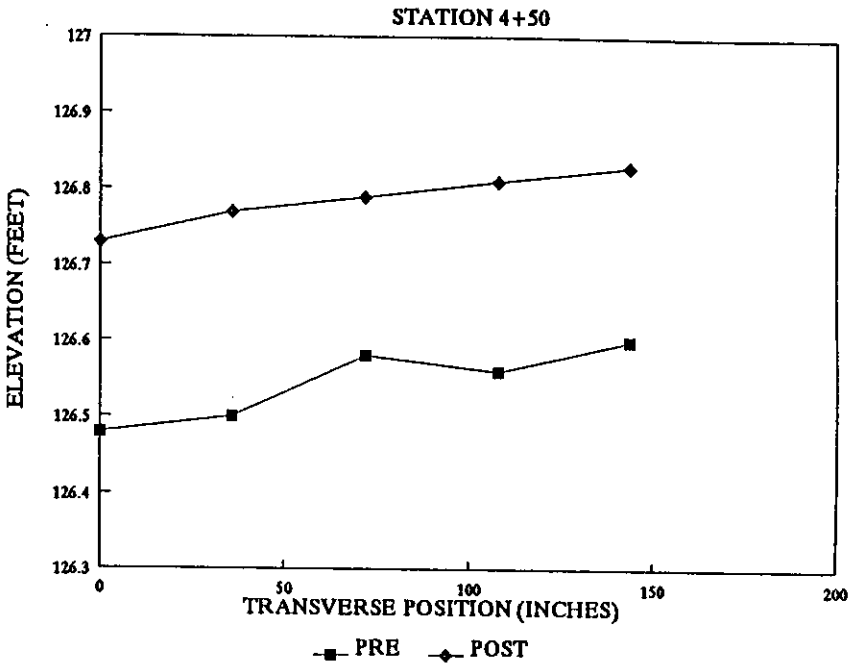


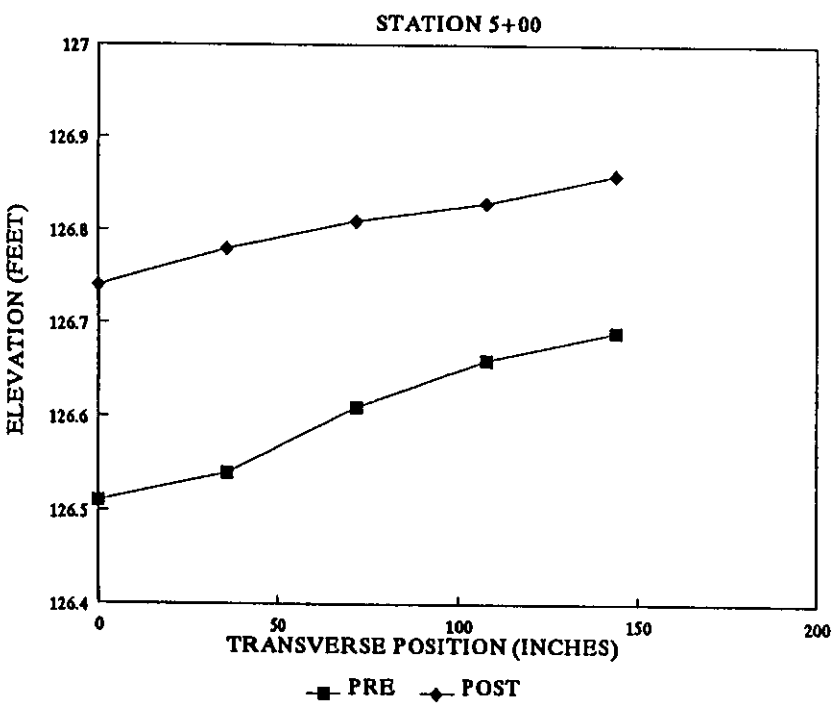




SECTION 48A506





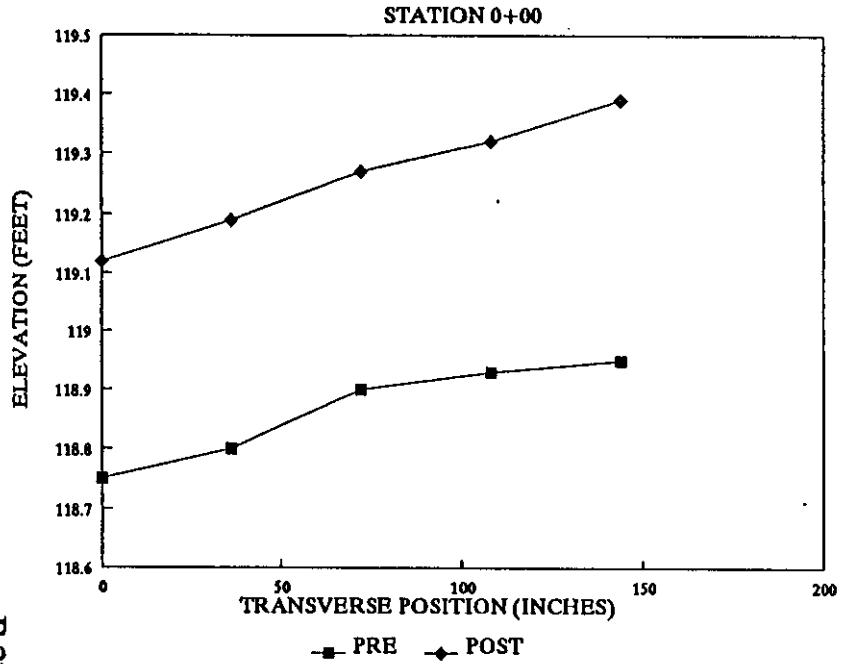


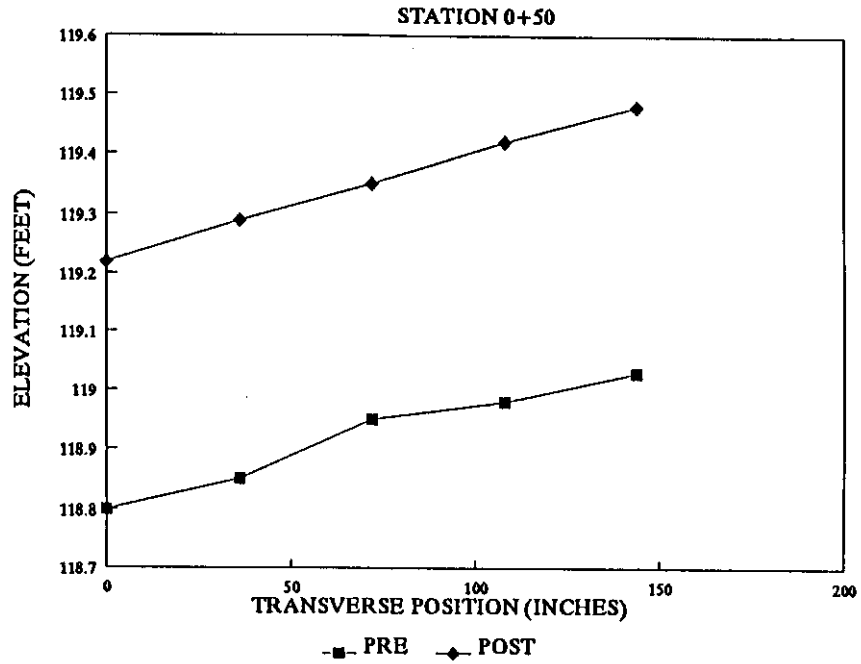
SECTION 48A507

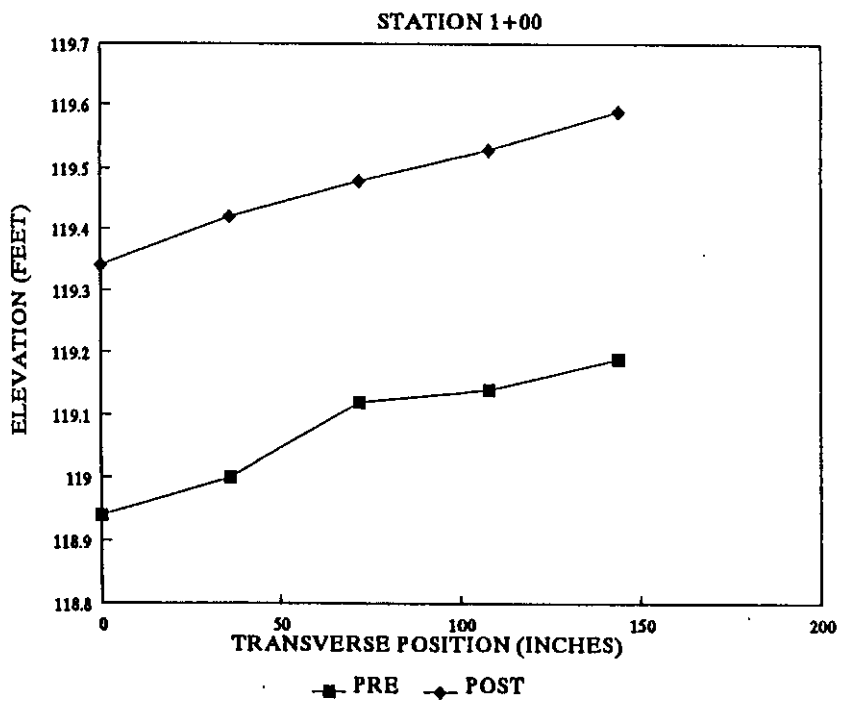
Trans. Offset		0'	Overlay Depth (IN.)	3'	Overlay Depth (IN.)	6'	Overlay Depth (IN.)	9'	Overlay Depth (IN.)	12'	Overlay Depth (IN.)
0+00	PRE	118.75	4.44	118.80	4.68	118.90	4.44	118.93	4.68	118.95	5.28
	POST	119.12		119.19		119.27		119.32		119.39	
0+50	PRE	118.80	5.04	118.85	5.28	118.95	4.80	118.98	5.28	119.03	5.40
	POST	119.22		119.29		119.35		119.42		119.48	
1+00	PRE	118.94	4.80	119.00	5.04	119.12	4.32	119.14	4.68	119.19	4.80
	POST	119.34		119.42		119.48		119.53		119.59	
1+50	PRE	119.07	5.28	119.10	5.76	119.20	5.28	119.24	5.40	119.30	5.16
	POST	119.51		119.58		119.64		119.69		119.73	
2+00	PRE	119.28	5.16	119.31	5.76	119.41	5.04	119.42	5.52	119.47	5.64
	POST	119.71		119.79		119.83		119.88		119.94	
2+50	PRE	119.49	5.16	119.55	5.16	119.63	4.80	119.65	5.16	119.70	5.28
	POST	119.92		119.98		120.03		120.08		120.14	
3+00	PRE	119.69	5.64	119.75	5.64	119.85	5.04	119.88	5.28	119.95	5.04
	POST	120.16		120.22		120.27		120.32		120.37	
3+50	PRE	120.03	5.16	120.06	5.52	120.17	4.80	120.19	5.16	120.23	5.28
	POST	120.46		120.52		120.57		120.62		120.67	
4+00	PRE	120.39	5.16	120.42	5.52	120.54	4.56	120.54	5.04	120.60	5.04
	POST	120.82		120.88		120.92		120.96		121.02	
4+50	PRE	120.83	5.04	120.84	5.52	120.93	5.04	120.93	5.40	120.98	5.40
	POST	121.25		121.30		121.35		121.38		121.43	
5+00	PRE	121.24	4.80	121.24	5.16	121.31	4.80	121.32	5.04	121.36	5.04
	POST	121.64		121.67		121.71		121.74		121.78	

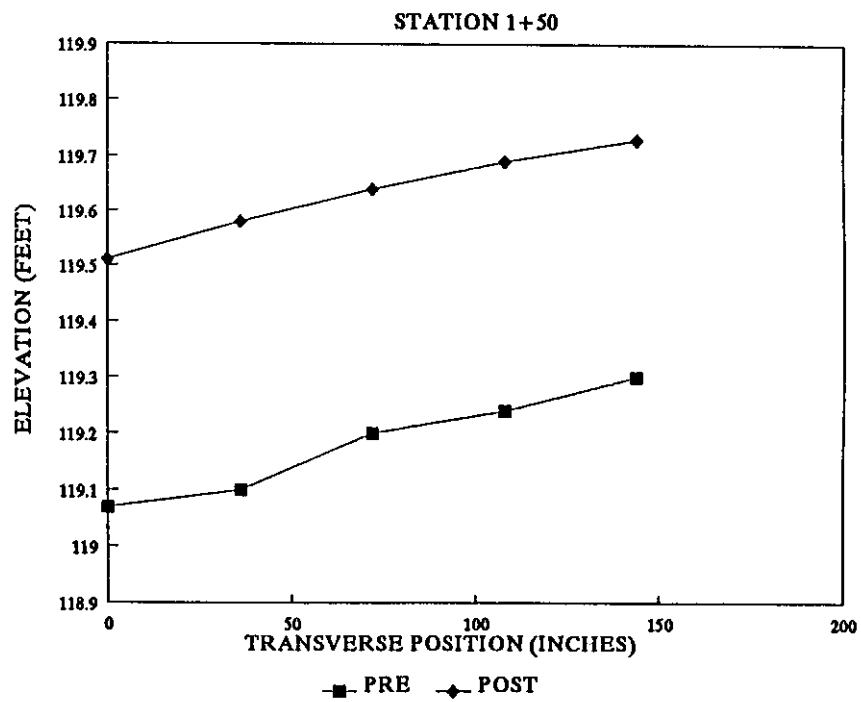
48a500.wk3

SECTION 48A507

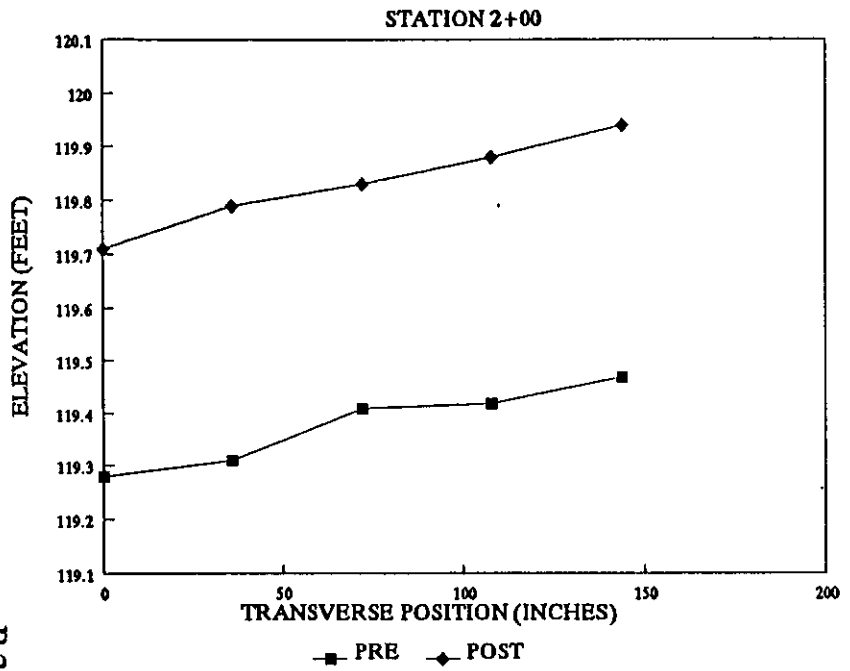


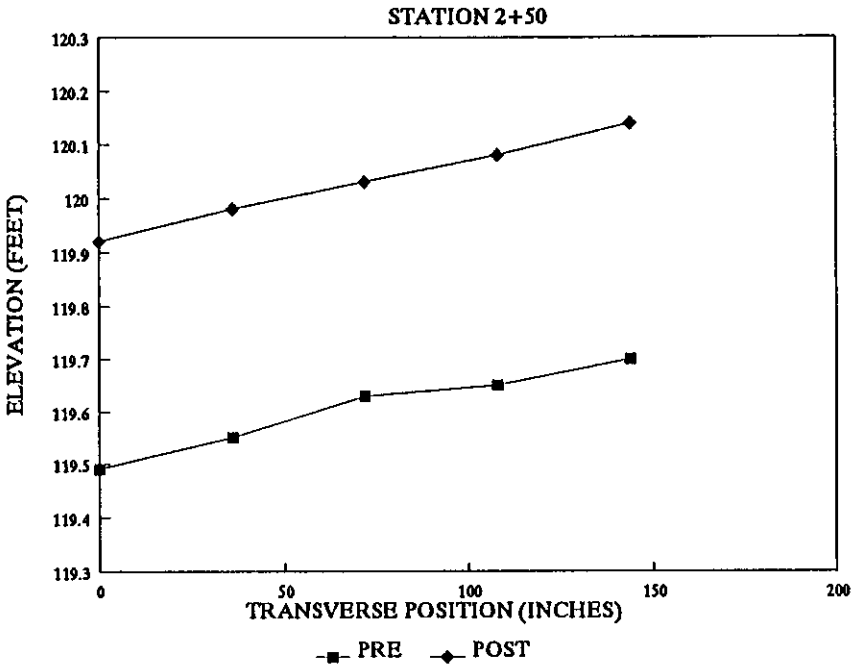


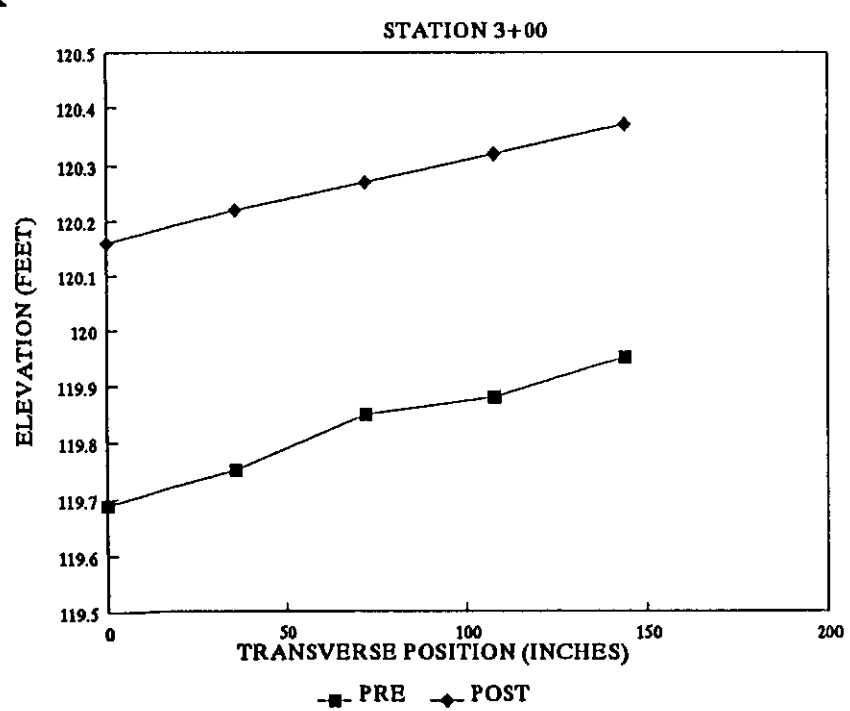


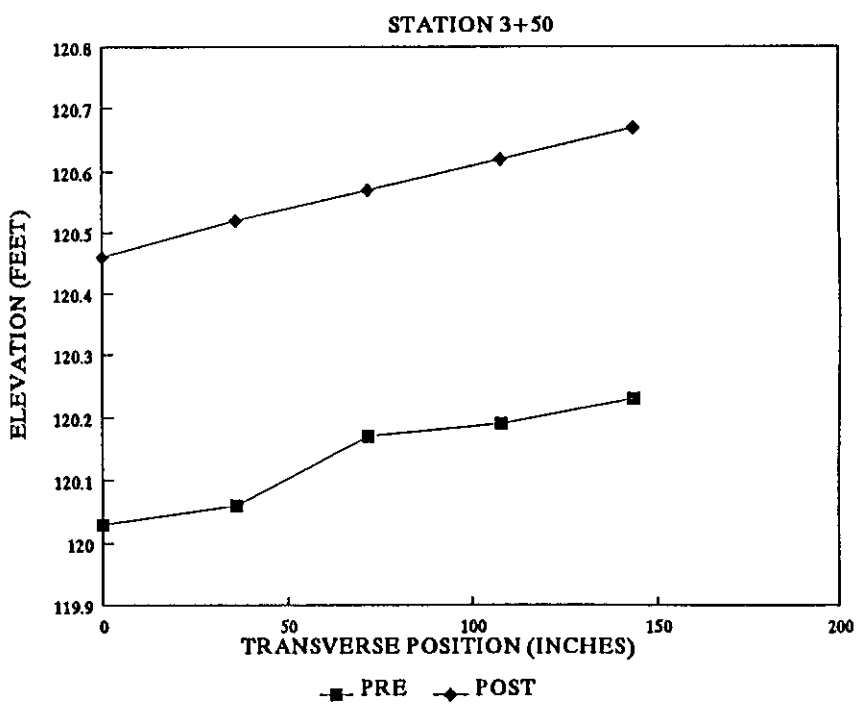


SECTION 48A507

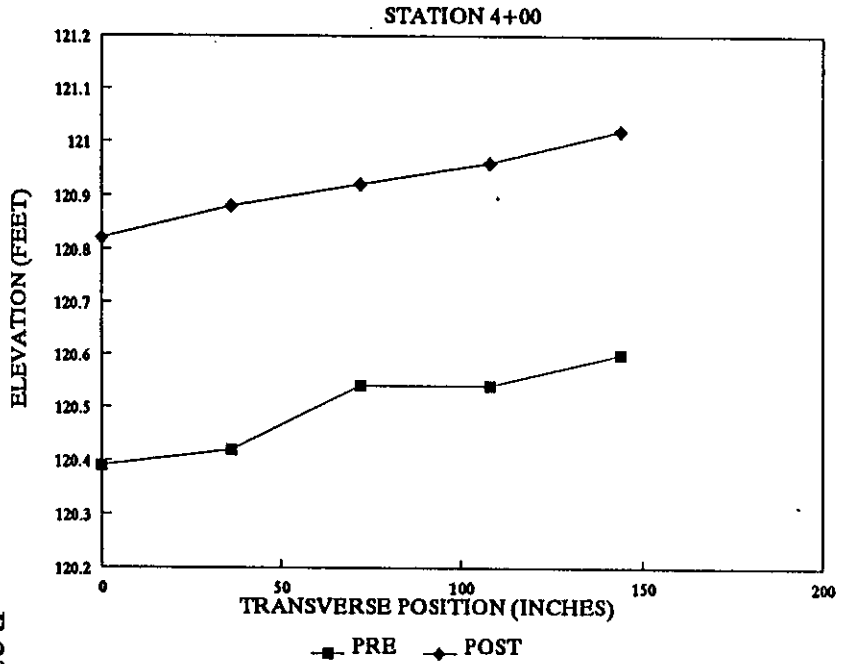


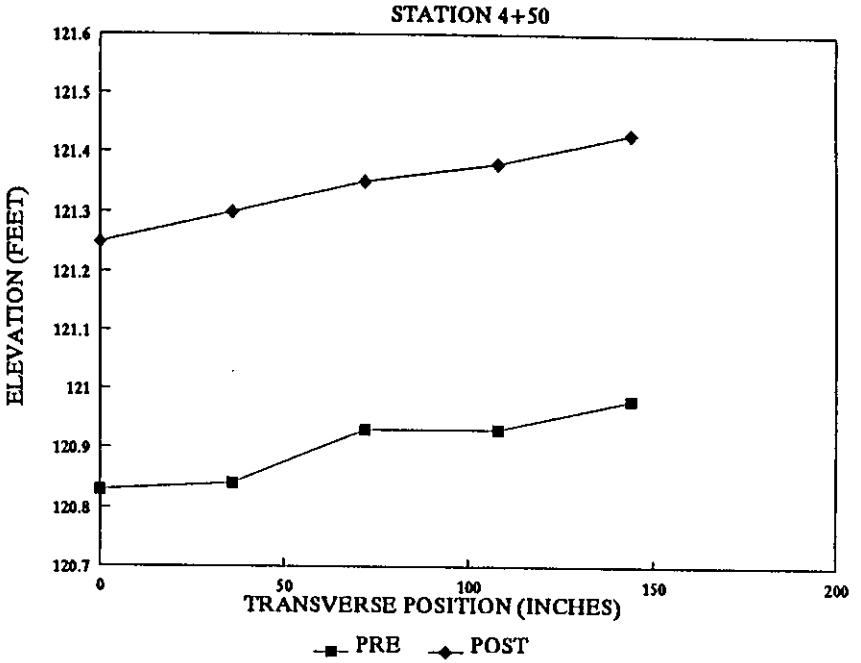


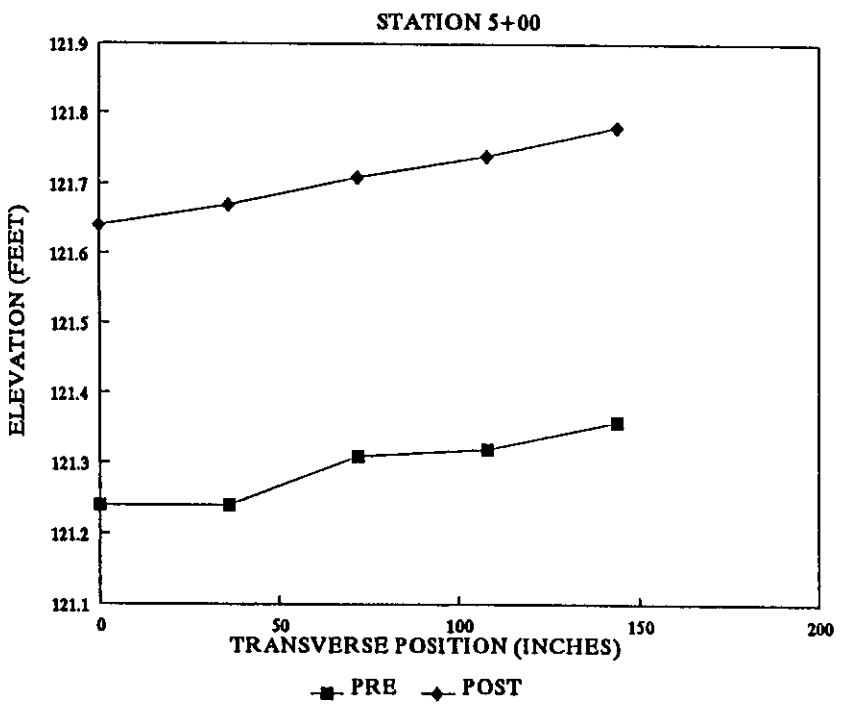




SECTION 48A507





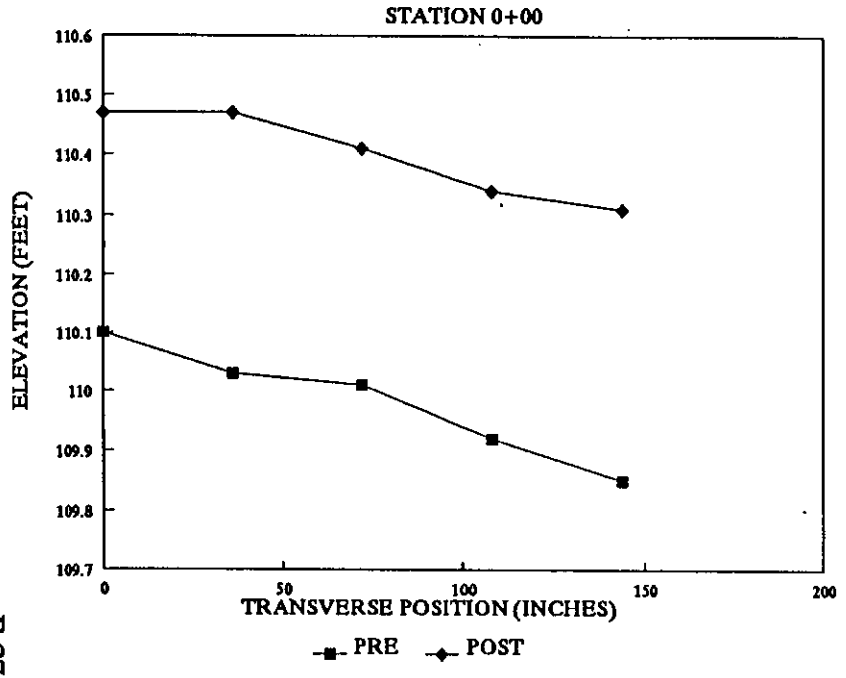


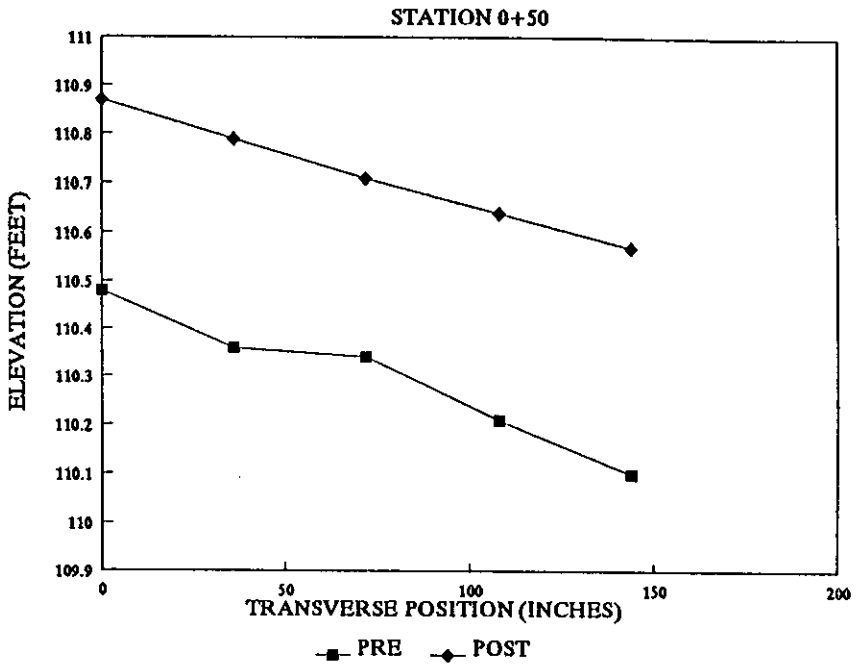
SECTION 48A508

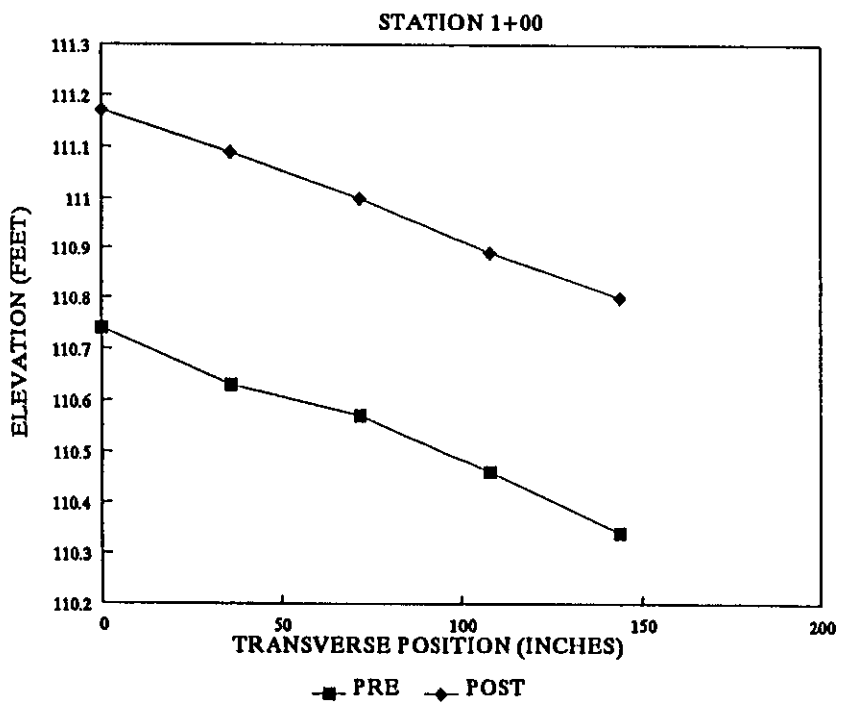
Trans.	Offset	0'	Overlay Depth (IN.)	3'	Overlay Depth (IN.)	6'	Overlay Depth (IN.)	9'	Overlay Depth (IN.)	12'	Overlay Depth (IN.)
0+00	PRE	110.10	4.44	110.03	5.28	110.01	4.80	109.92	5.04	109.85	5.52
	110.50	110.47		110.47		110.41		110.34		110.31	
0+50	PRE	110.48	4.68	110.36	5.16	110.34	4.44	110.21	5.16	110.10	5.64
	POST	110.87		110.79		110.71		110.64		110.57	
1+00	PRE	110.74	5.16	110.63	5.52	110.57	5.16	110.46	5.16	110.34	5.52
	POST	111.17		111.09		111.00		110.89		110.80	
1+50	PRE	110.91	5.04	110.79	5.52	110.73	5.04	110.59	5.52	110.49	5.52
	POST	111.33		111.25		111.15		111.05		110.95	
2+00	PRE	111.11	5.40	111.01	5.64	110.94	5.16	110.81	5.40	110.68	5.64
	POST	111.56		111.48		111.37		111.26		111.15	
2+50	PRE	111.48	4.80	111.36	5.16	111.26	5.16	111.11	5.64	111.00	5.52
	POST	111.88		111.79		111.69		111.58		111.46	
3+00	PRE	111.86	5.16	111.74	5.28	111.66	4.92	111.52	5.40	111.41	5.64
	POST	112.29		112.18		112.07		111.97		111.88	
3+50	PRE	112.31	4.56	112.17	5.04	112.10	4.56	111.94	5.28	111.81	5.40
	POST	112.69		112.59		112.48		112.38		112.26	
4+00	PRE	112.75	5.28	112.61	5.64	112.55	4.92	112.41	5.28	112.31	5.04
	POST	113.19		113.08		112.96		112.85		112.73	
4+50	PRE	113.26	5.16	113.13	5.28	113.04	4.92	112.91	5.04	112.80	4.92
	POST	113.69		113.57		113.45		113.33		113.21	
5+00	PRE	113.76	5.16	113.63	5.28	113.56	4.68	113.41	5.16	113.30	5.04
	POST	114.19		114.07		113.95		113.84		113.72	

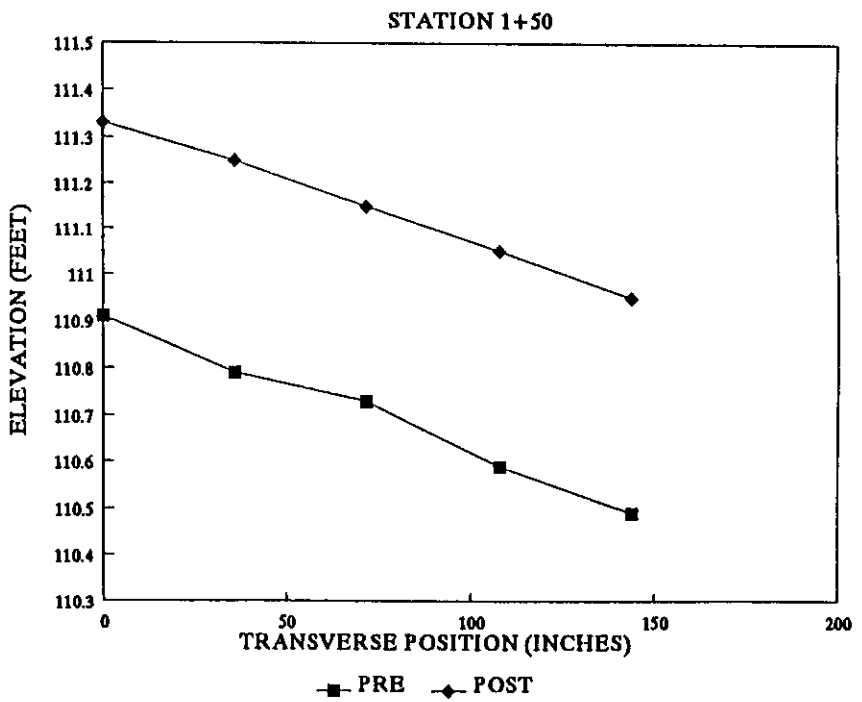
48a500.wk3

SECTION 48A508

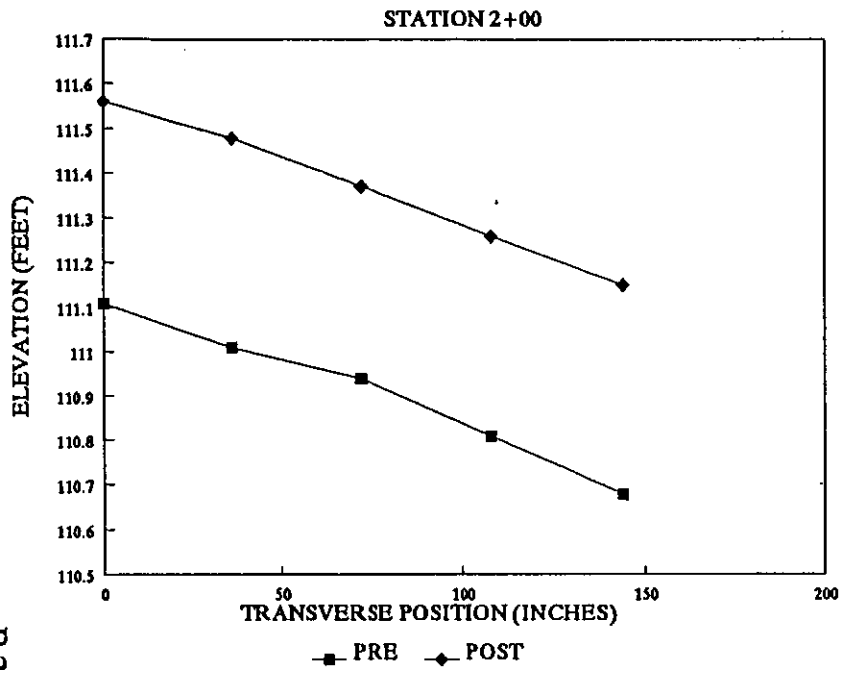


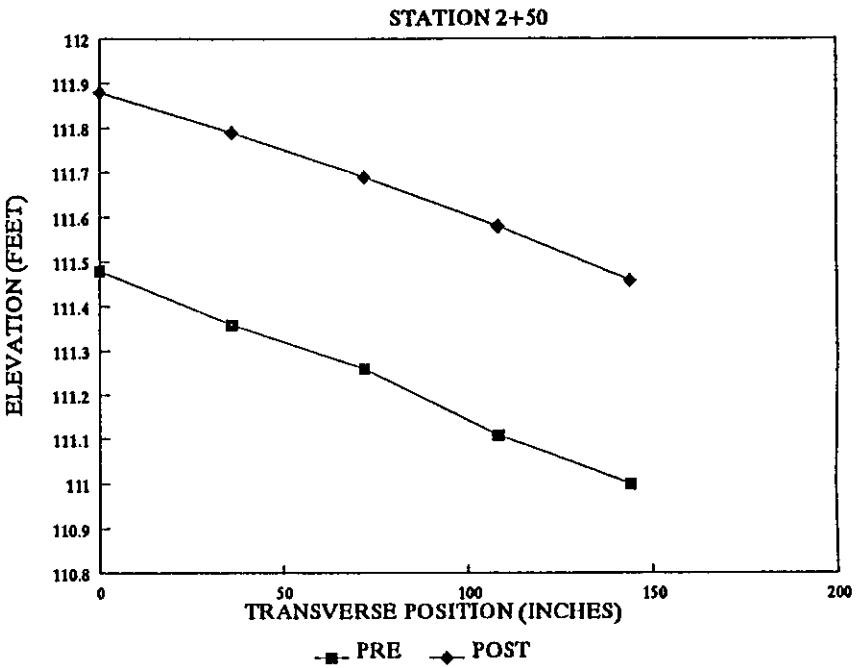


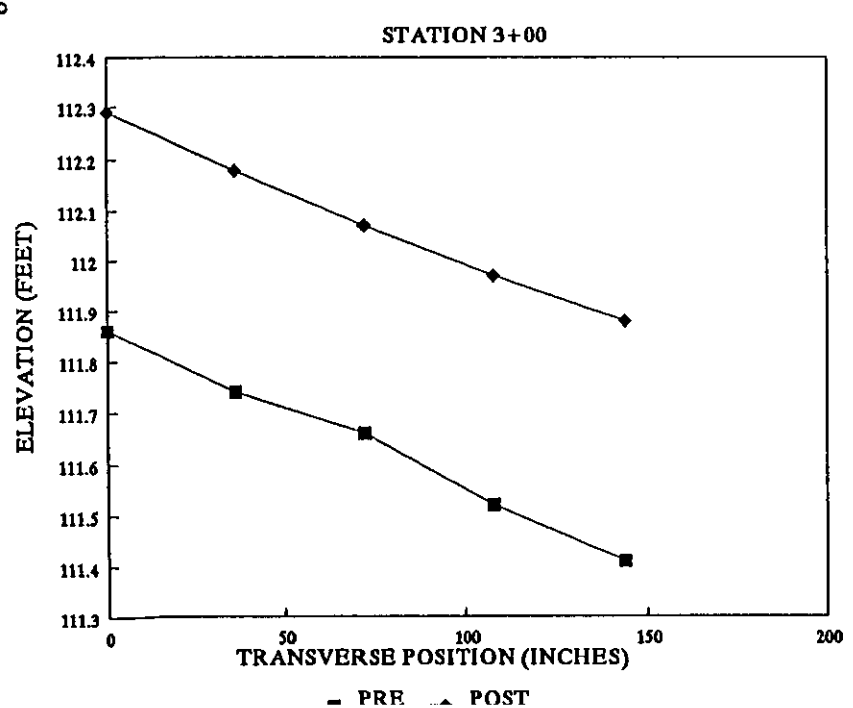


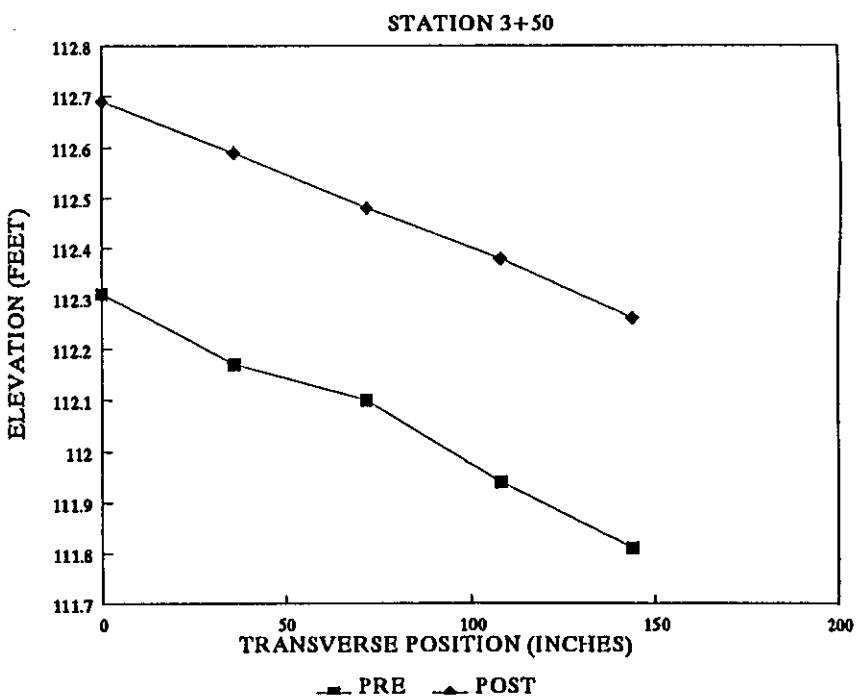


SECTION 48A508

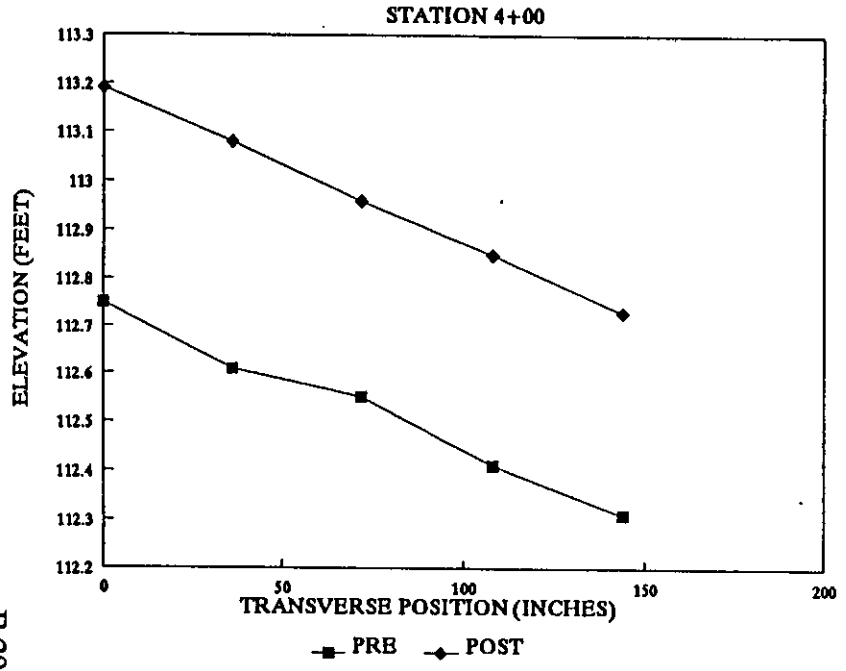


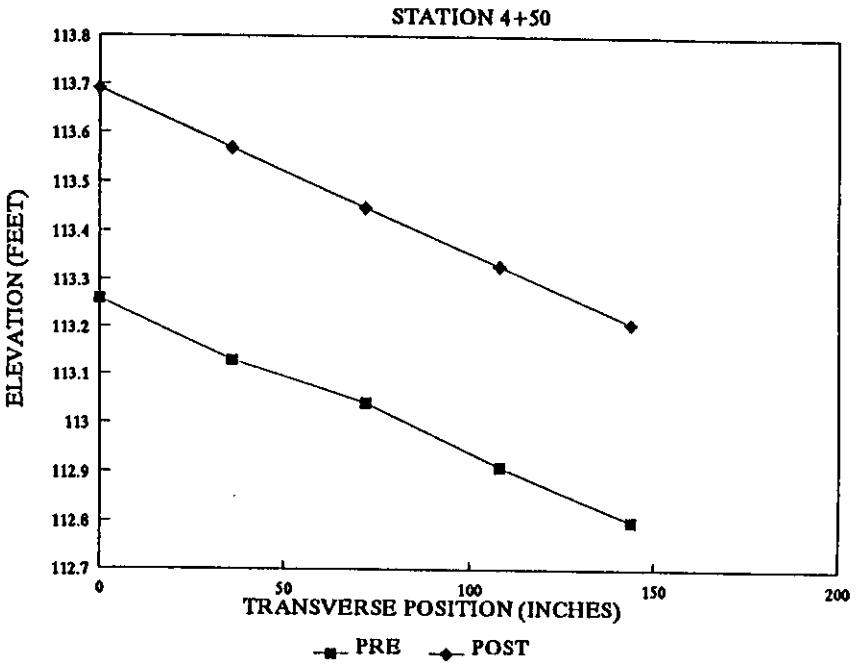


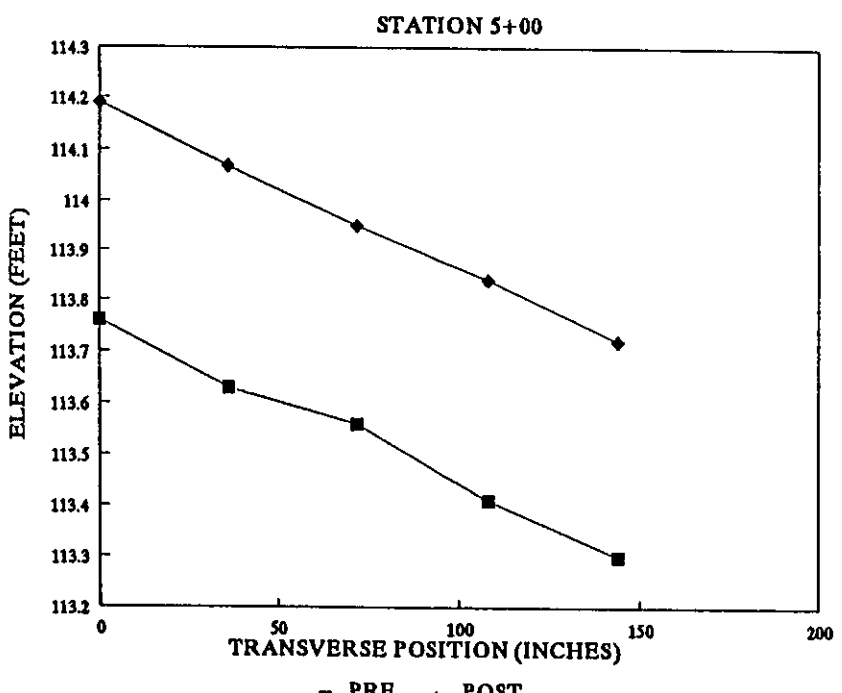




SECTION 48A508





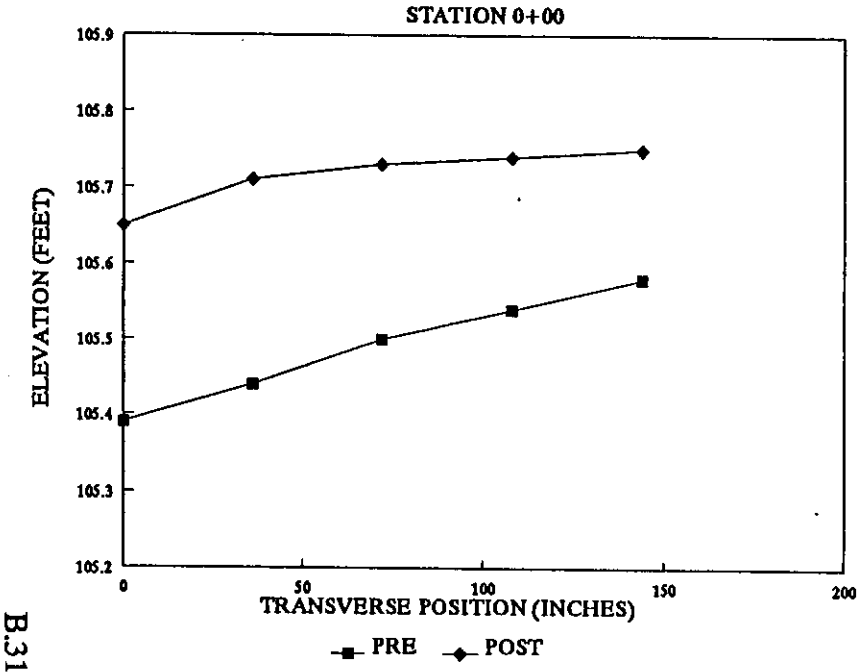


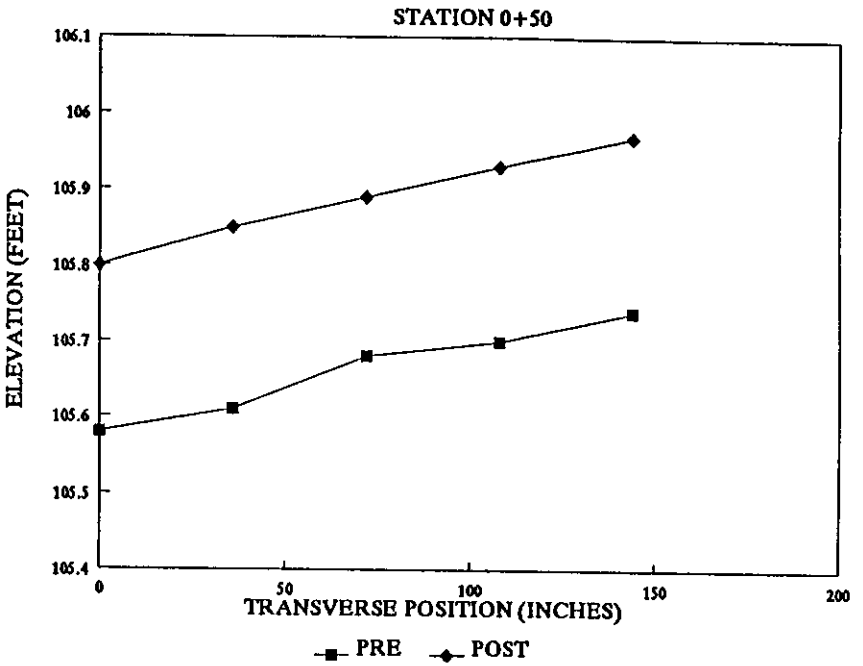
SECTION 48A509

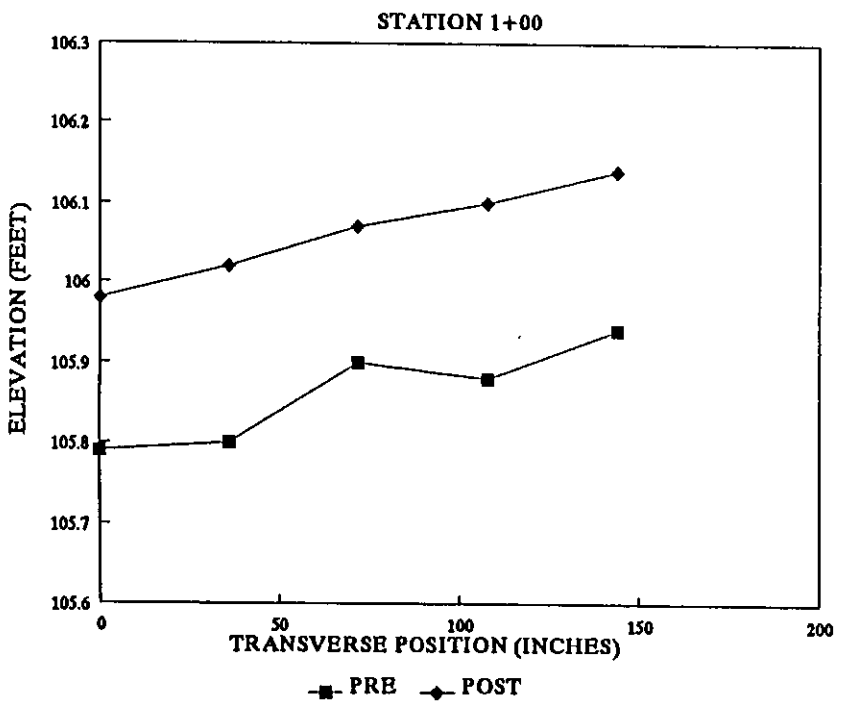
Trans.	Offset	0'	Overlay Depth (IN.)	3'	Overlay Depth (IN.)	6'	Overlay Depth (IN.)	9'	Overlay Depth (IN.)	12'	Overlay Depth (IN.)
0+00	PRE	105.39	3.12	105.44	3.24	105.50	2.76	105.54	2.40	105.58	2.04
	POST	105.65		105.71		105.73		105.74		105.75	
0+50	PRE	105.58	2.64	105.61	2.88	105.68	2.52	105.70	2.76	105.74	2.76
	POST	105.80		105.85		105.89		105.93		105.97	
1+00	PRE	105.79	2.28	105.80	2.64	105.90	2.04	105.88	2.64	105.94	2.40
	POST	105.98		106.02		106.07		106.10		106.14	
1+50	PRE	106.02	2.28	106.05	2.64	106.13	2.16	106.14	2.52	106.20	2.28
	POST	106.21		106.27		106.31		106.35		106.39	
2+00	PRE	106.24	2.16	106.28	2.52	106.38	1.68	106.38	2.28	106.43	2.04
	POST	106.42		106.49		106.52		106.57		106.60	
2+50	PRE	106.36	********	106.40	2.88	106.47	2.52	106.47	2.76	106.50	2.88
	POST			106.64		106.68		106.70		106.74	
3+00	PRE	106.61	2.28	106.63	2.40	106.73	1.80	106.69	2.64	106.73	2.52
	POST	106.80		106.83		106.88		106.91		106.94	
3+50	PRE	106.79	1.80	106.85	2.16	106.92	1.92	106.93	2.28	106.98	2.40
	POST	106.94		107.03		107.08		107.12		107.18	
4+00	PRE	107.03	1.32	107.10	1.80	107.19	1.68	107.17	2.52	107.23	2.16
	POST	107.14		107.25		107.33		107.38		107.41	
4+50	PRE	107.32	1.80	107.35	2.16	107.43	1.92	107.44	2.28	107.50	2.04
	POST	107.47		107.53		107.59		107.63		107.67	
5+00	PRE	107.62	1.32	107.65	2.16	107.74	1.80	107.75	2.16	107.82	2.04
	POST	107.73		107.83		107.89		107.93		107.99	

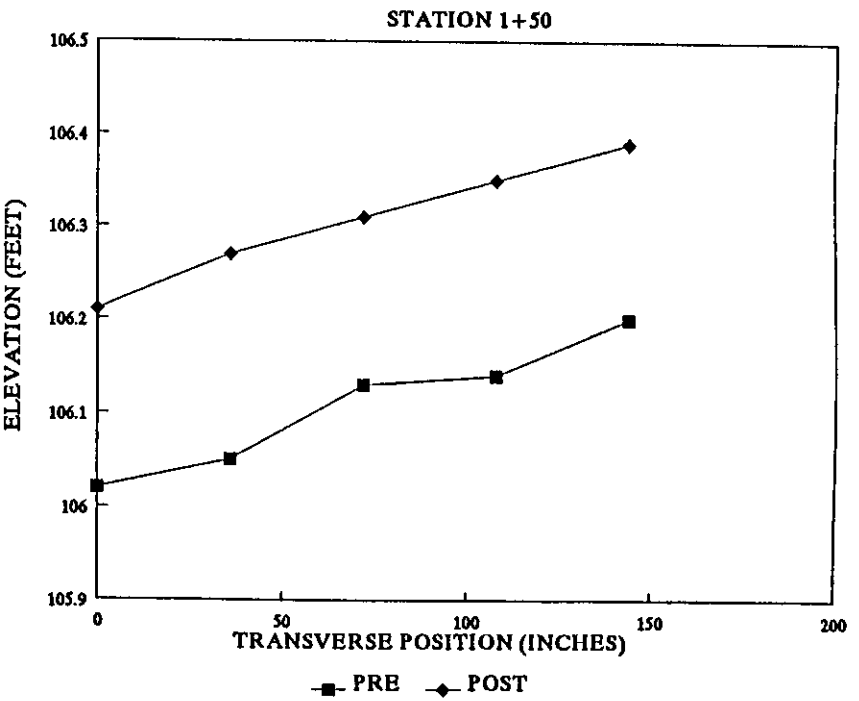
48a500.wk3

SECTION 48A509

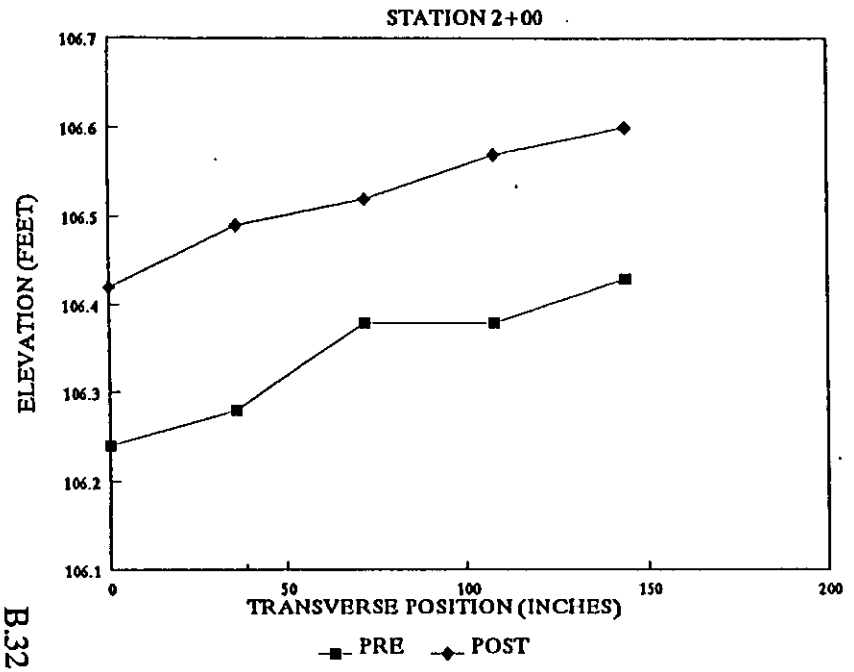


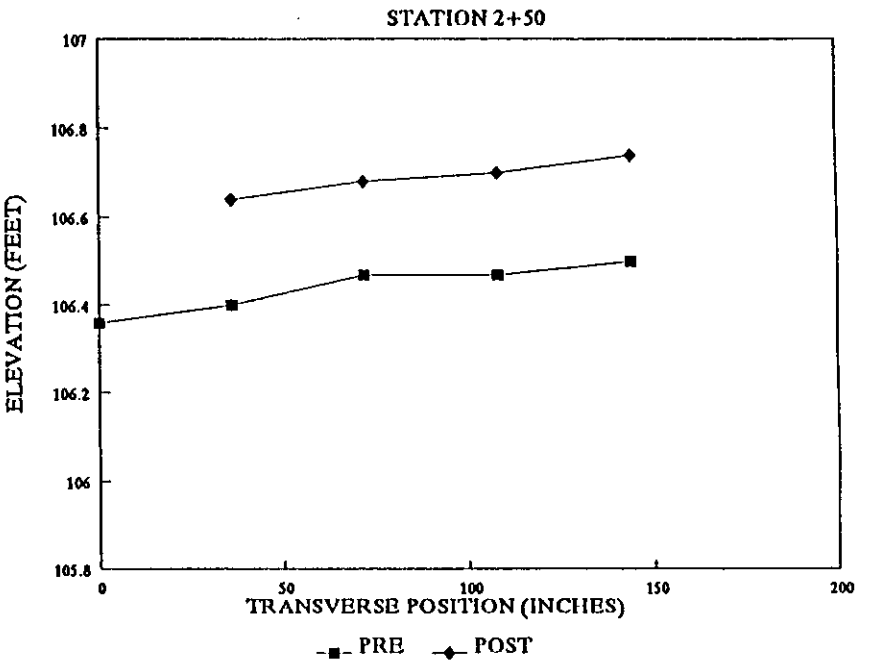


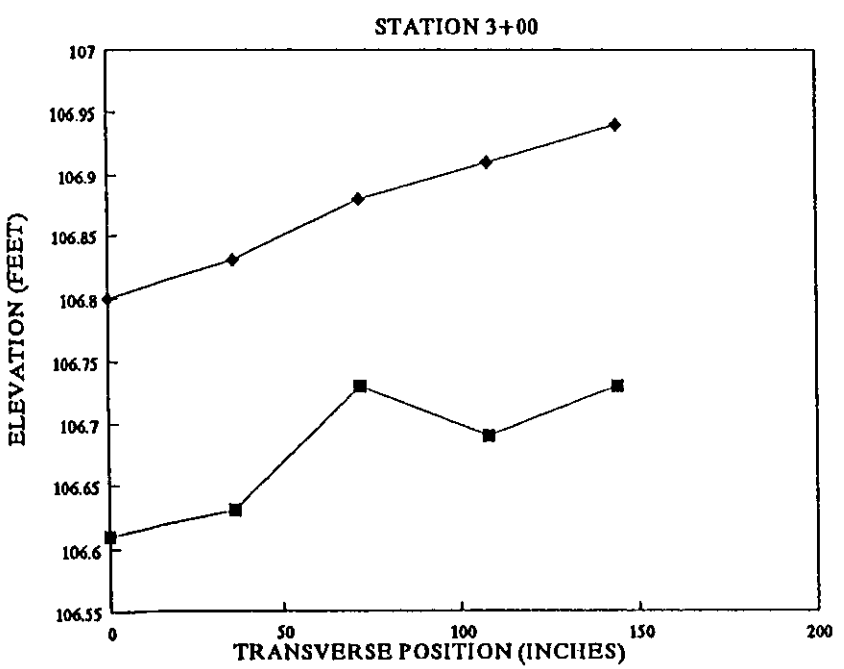


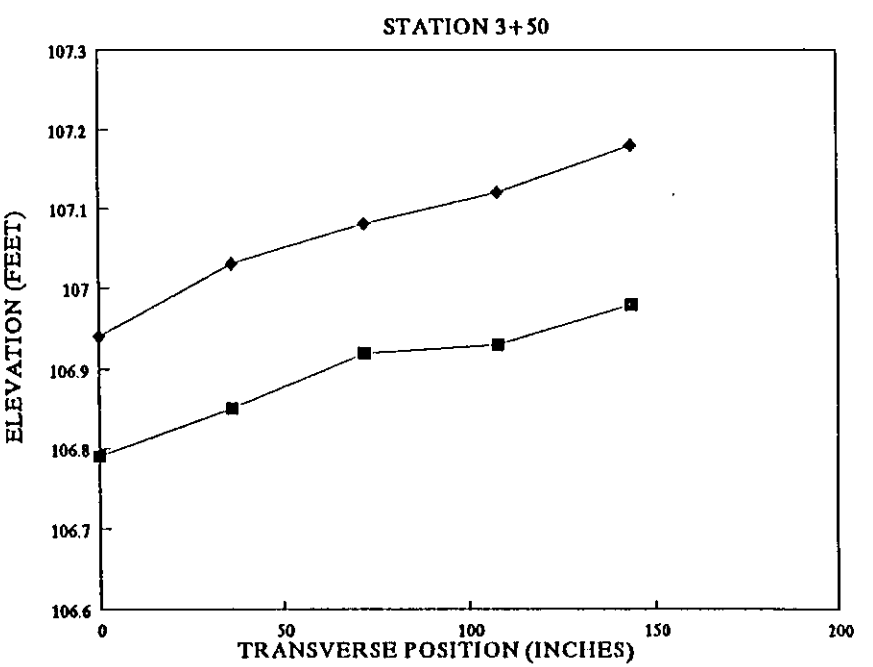


SECTION 48A509

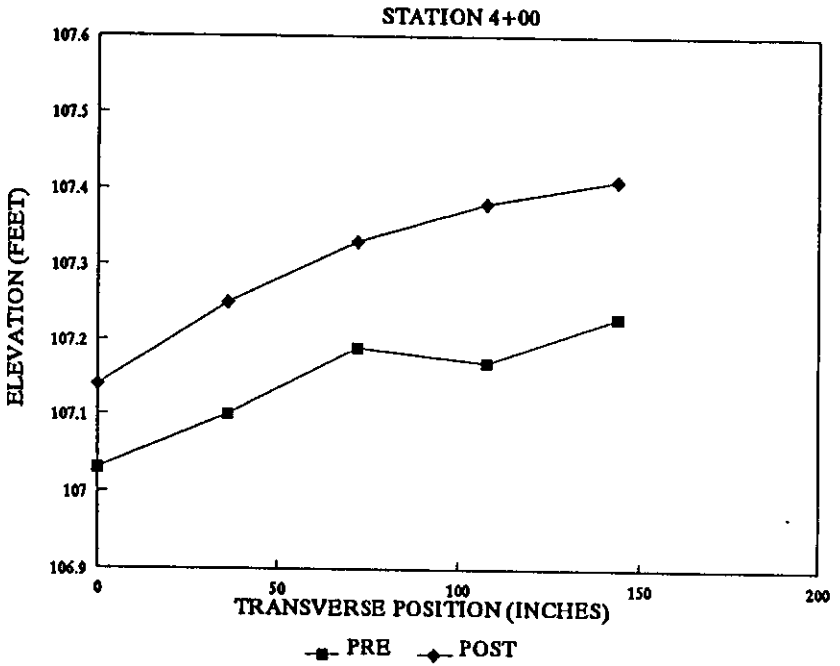


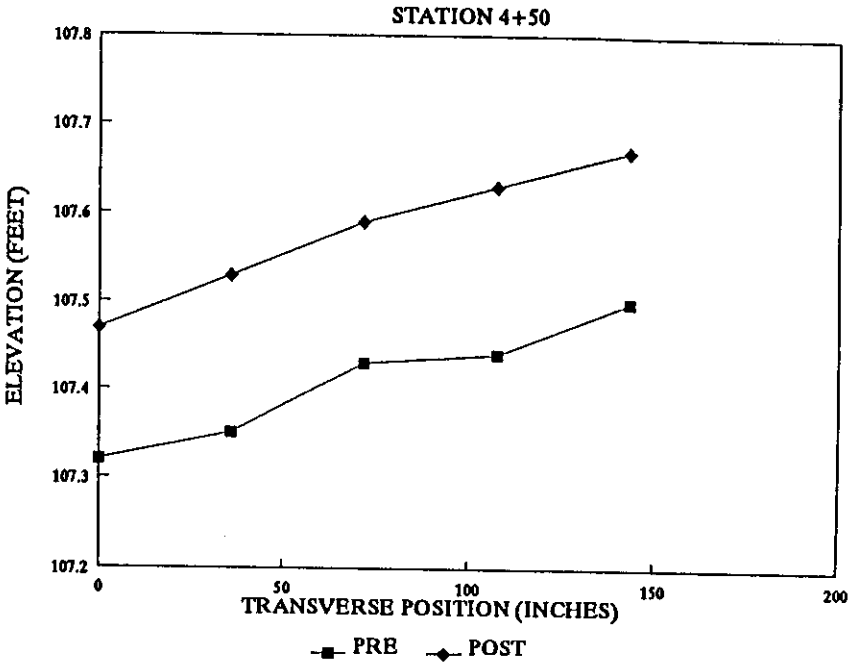


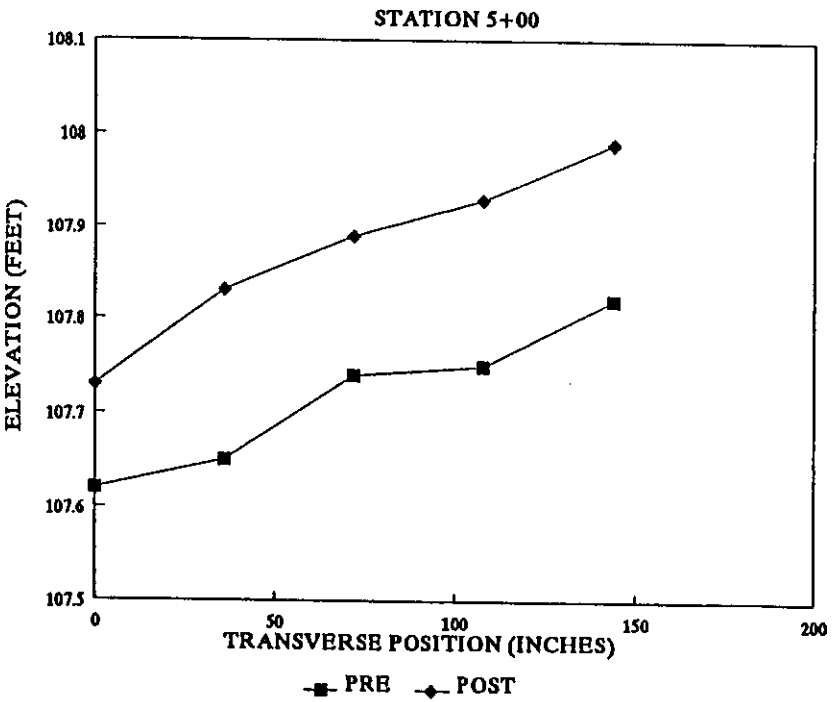




SECTION 48A509

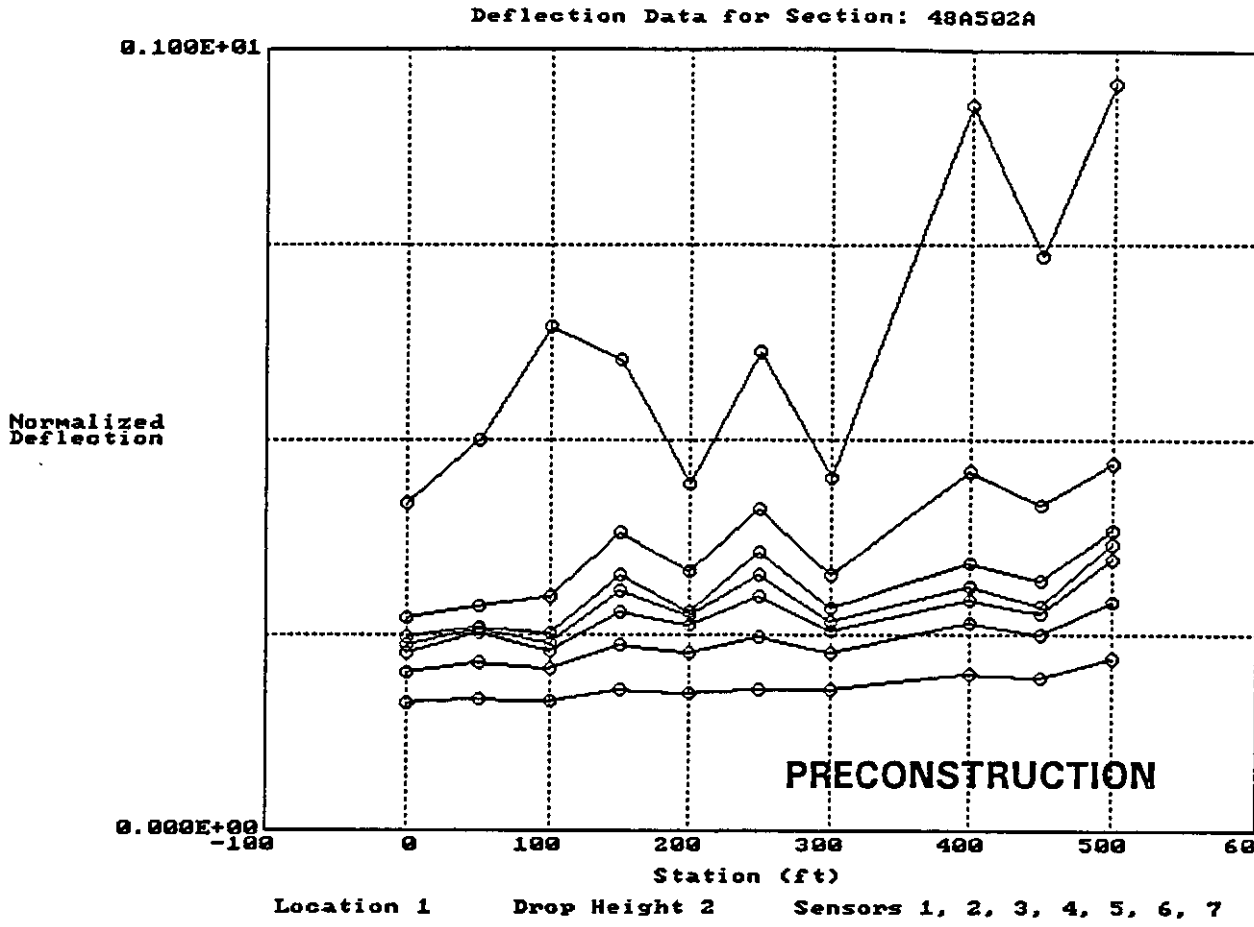


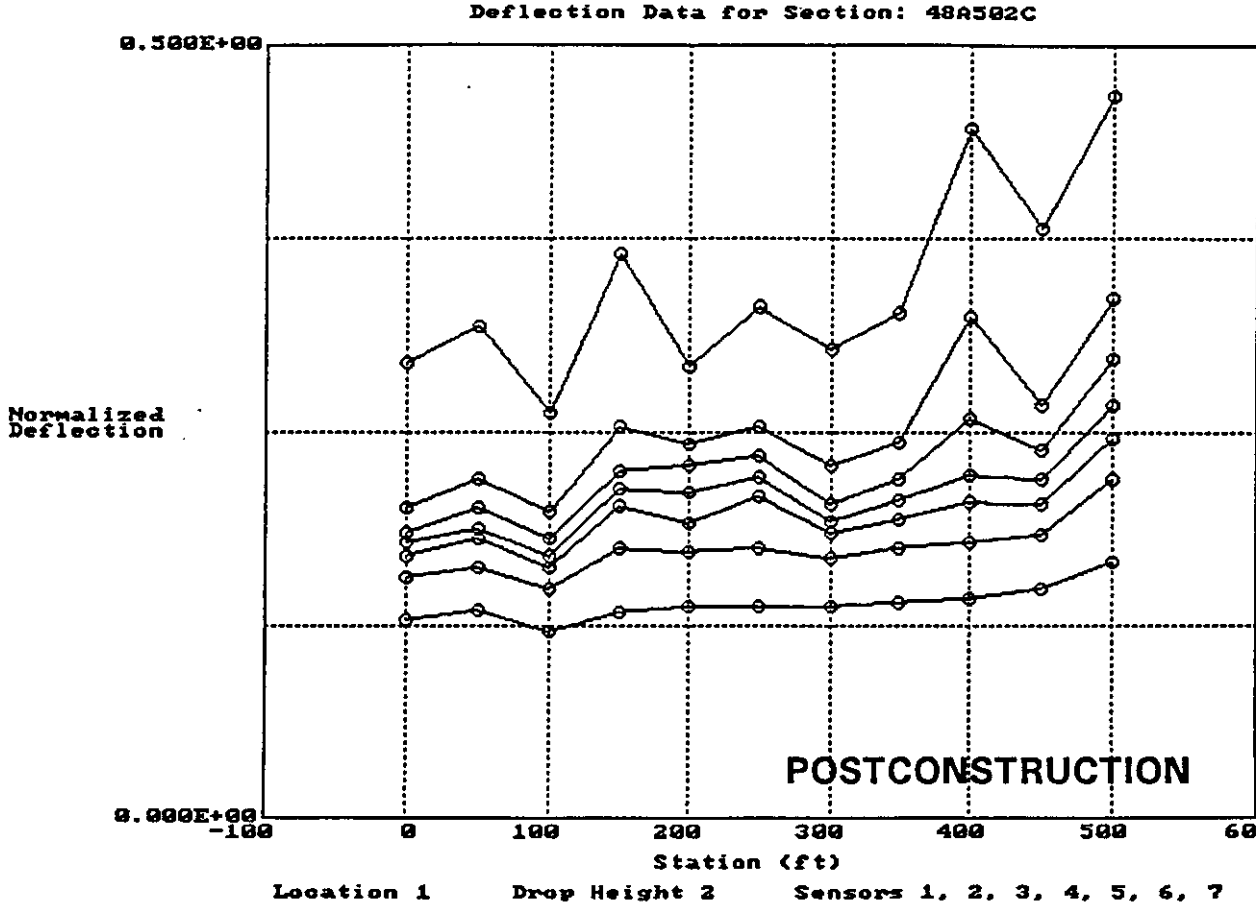




APPENDIX C

STRUCTURAL CAPACITY DATA


Deflection Data for Section: 48A502A
0.100E+01
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
PRECONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7


Deflection Data for Section: 48A502C
0.500E+00
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
POSTCONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7

PRECONSTRUCTION

Summary of Data for section 48A502A
Analyzed by: on 07-01-1992

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	1	0.6399	0.3628	0.3000	0.2816	0.2675	0.2321	0.1777
	2	0.6302	0.3662	0.3062	0.2882	0.2726	0.2377	0.1822
	3	0.6160	0.3601	0.3020	0.2838	0.2677	0.2330	0.1771
	4	0.6093	0.3535	0.2979	0.2805	0.2658	0.2286	0.1733

Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.2125	0.0718	0.0467	0.0404	0.0379	0.0275	0.0168
	2	0.1932	0.0722	0.0479	0.0409	0.0356	0.0278	0.0178
	3	0.1824	0.0668	0.0462	0.0398	0.0342	0.0259	0.0153
	4	0.1771	0.0663	0.0469	0.0408	0.0360	0.0266	0.0166

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	33.21%	19.78%	15.58%	14.36%	14.18%	11.85%	9.46%
	2	30.65%	19.73%	15.64%	14.21%	13.07%	11.69%	9.75%
	3	29.60%	18.56%	15.31%	14.03%	12.78%	11.13%	8.65%
	4	29.07%	18.76%	15.73%	14.53%	13.53%	11.63%	9.59%

POSTCONSTRUCTION

Summary of Data for section 48A502C
Analyzed by: on 07-01-1992

UNCORRECTED Overall Deflection Statistics

Mean Values (mils/kip)

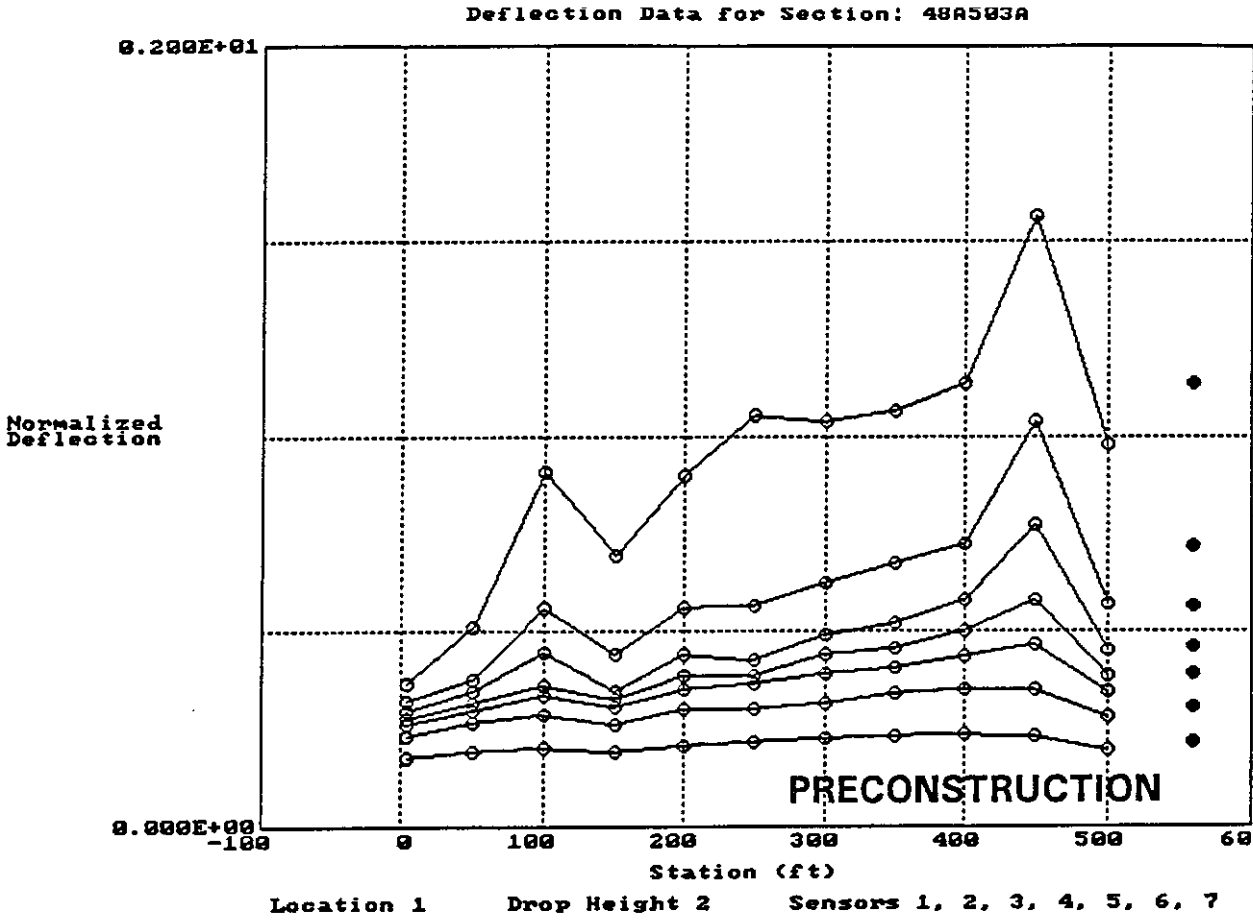
Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.3406	0.2461	0.2199	0.2031	0.1921	0.1699	0.1330
	2	0.3446	0.2520	0.2250	0.2084	0.1955	0.1742	0.1389
	3	0.3448	0.2488	0.2216	0.2058	0.1936	0.1718	0.1354
	4	0.3326	0.2387	0.2121	0.1964	0.1852	0.1632	0.1287

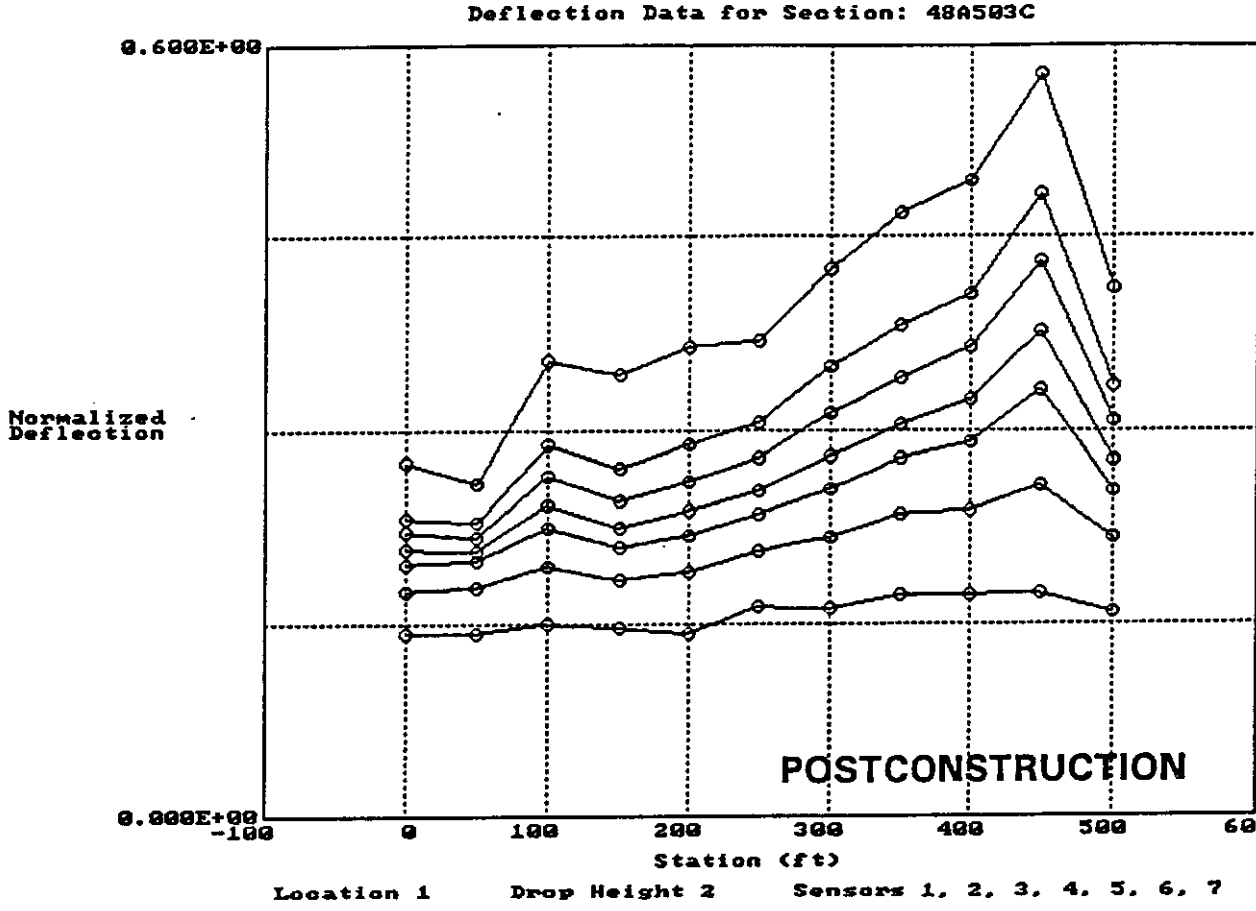
Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.0660	0.0455	0.0332	0.0253	0.0224	0.0177	0.0114
	2	0.0648	0.0445	0.0337	0.0266	0.0226	0.0184	0.0114
	3	0.0644	0.0441	0.0331	0.0259	0.0222	0.0178	0.0106
	4	0.0620	0.0421	0.0315	0.0252	0.0214	0.0162	0.0098

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	19.39%	18.50%	15.08%	12.47%	11.66%	10.39%	8.60%
	2	18.79%	17.66%	14.98%	12.78%	11.56%	10.54%	8.20%
	3	18.67%	17.73%	14.93%	12.60%	11.45%	10.39%	7.86%
	4	18.65%	17.65%	14.84%	12.83%	11.56%	9.93%	7.60%


Deflection Data for Section: 48A503A
0.200E+01
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
PRECONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7


Deflection Data for Section: 48A503C
0.600E+00
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
POSTCONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7

PRECONSTRUCTION

Summary of Data for section 48A503A
Analyzed by: on 07-01-1992

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
0	1	1.1473	0.7247	0.5564	0.4575	0.3870	0.2956	0.2107
	2	1.1370	0.7176	0.5638	0.4620	0.3895	0.3033	0.2168
	3	1.1010	0.6996	0.5530	0.4585	0.3903	0.3039	0.2170
	4	1.0896	0.6940	0.5533	0.4616	0.3939	0.3044	0.2172
1	1	0.9464	0.5928	0.4615	0.3984	0.3552	0.2952	0.2071
	2	0.9289	0.5866	0.4644	0.4009	0.3592	0.2986	0.2081
	3	0.8999	0.5711	0.4569	0.3972	0.3556	0.2969	0.2069
	4	0.8765	0.5580	0.4504	0.3902	0.3496	0.2925	0.2018

Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
0	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	1	0.3506	0.2040	0.1368	0.0894	0.0625	0.0406	0.0208
	2	0.3229	0.1934	0.1319	0.0885	0.0624	0.0386	0.0211
	3	0.3062	0.1801	0.1244	0.0831	0.0600	0.0375	0.0195
	4	0.2911	0.1675	0.1164	0.0817	0.0598	0.0369	0.0195

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
0	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1	1	37.05%	34.41%	29.64%	22.44%	17.59%	13.76%	10.05%
	2	34.76%	32.97%	28.41%	22.07%	17.39%	12.92%	10.15%
	3	34.02%	31.54%	27.24%	20.92%	16.87%	12.64%	9.45%
	4	33.21%	30.01%	25.85%	20.94%	17.10%	12.62%	9.67%

POSTCONSTRUCTION

Summary of Data for section 48A503C
Analyzed by: on 07-01-1992

UNCORRECTED Overall Deflection Statistics

Mean Values (mils/kip)

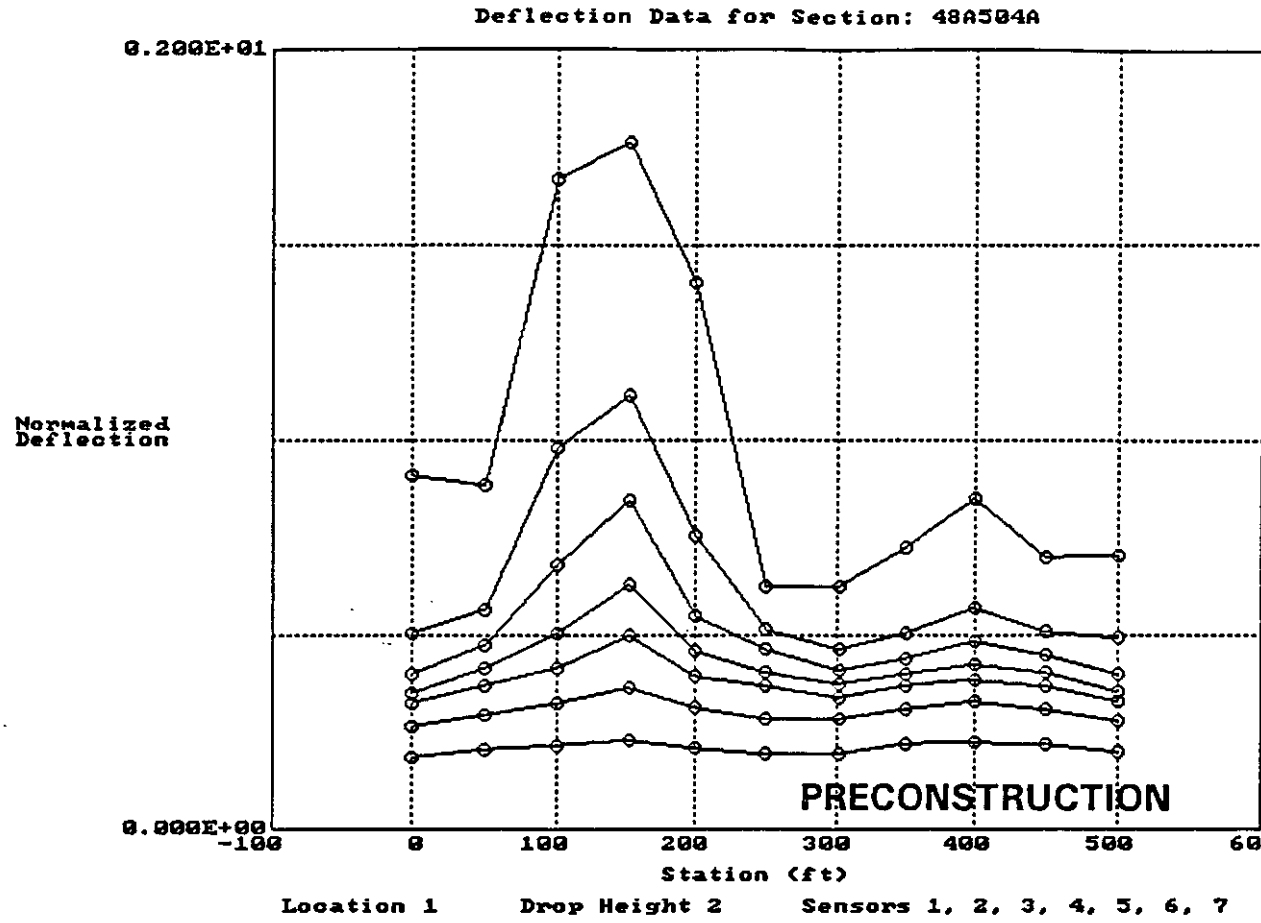
Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.3938	0.3217	0.2919	0.2642	0.2437	0.2071	0.1559
	2	0.3945	0.3247	0.2954	0.2670	0.2452	0.2090	0.1570
	3	0.3930	0.3207	0.2904	0.2625	0.2409	0.2049	0.1516
	4	0.3803	0.3101	0.2806	0.2533	0.2326	0.1970	0.1456

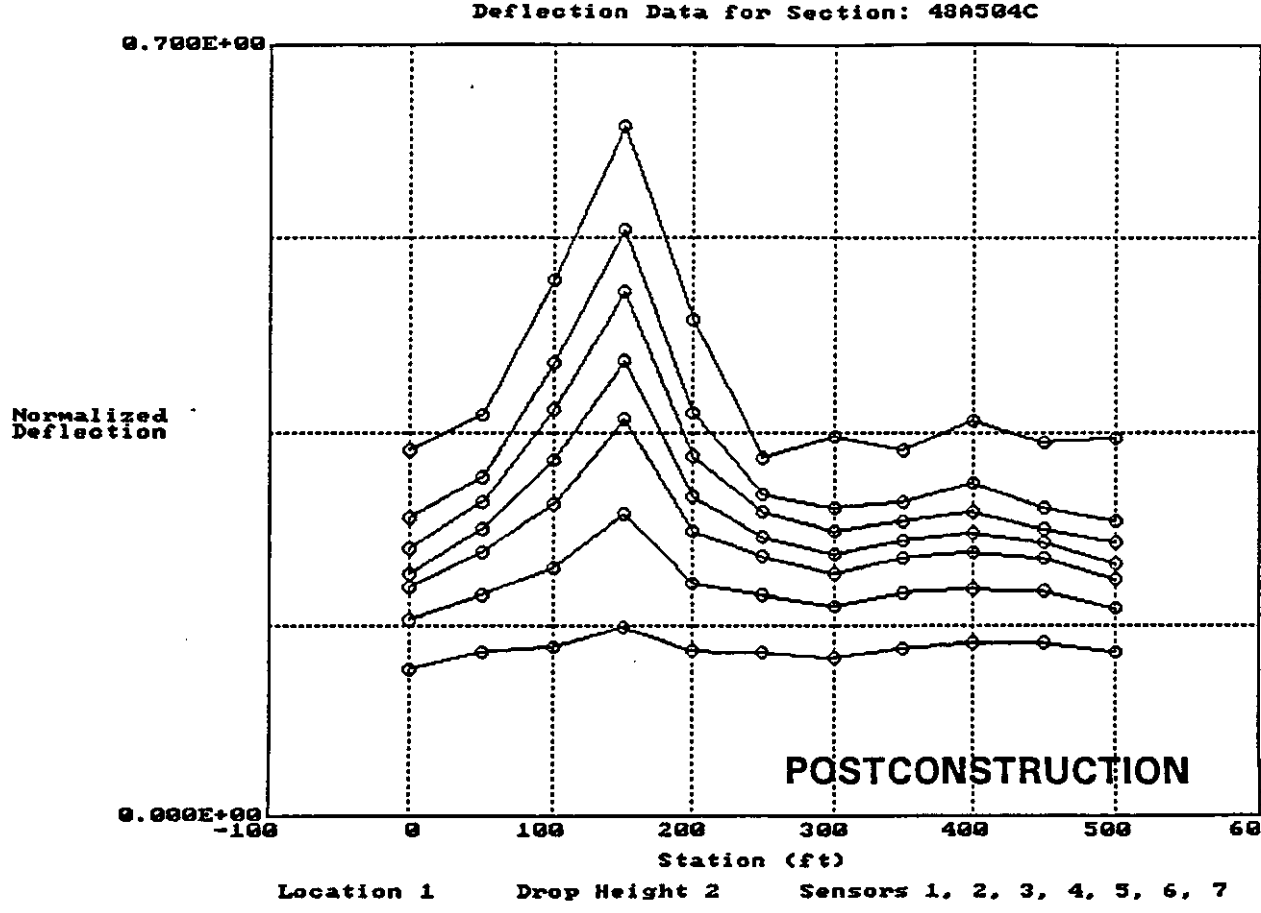
Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.0918	0.0752	0.0634	0.0506	0.0404	0.0261	0.0140
	2	0.0936	0.0764	0.0647	0.0521	0.0421	0.0270	0.0126
	3	0.0964	0.0789	0.0670	0.0538	0.0435	0.0281	0.0132
	4	0.0932	0.0762	0.0649	0.0522	0.0412	0.0269	0.0117

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	23.32%	23.36%	21.72%	19.16%	16.56%	12.62%	8.97%
	2	23.74%	23.52%	21.91%	19.52%	17.15%	12.94%	8.02%
	3	24.54%	24.61%	23.06%	20.49%	18.04%	13.69%	8.72%
	4	24.51%	24.56%	23.14%	20.62%	17.73%	13.66%	8.04%


Deflection Data for Section: 48A504A
0.200E+01
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
PRECONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7


Deflection Data for Section: 48A504C
0.700E+00
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
POSTCONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7

PRECONSTRUCTION

Summary of Data for section 48A504A
Analyzed by: on 07-01-1992

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	1	1.0266	0.6431	0.5104	0.4272	0.3749	0.3035	0.2058
	2	0.9876	0.6340	0.5092	0.4296	0.3783	0.3057	0.2087
	3	0.9531	0.6172	0.5016	0.4268	0.3776	0.3059	0.2090
	4	0.9285	0.6042	0.4933	0.4217	0.3731	0.3028	0.2053

Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.4690	0.2357	0.1428	0.0809	0.0485	0.0283	0.0123
	2	0.4215	0.2205	0.1370	0.0792	0.0483	0.0281	0.0139
	3	0.3858	0.2010	0.1267	0.0748	0.0472	0.0280	0.0131
	4	0.3688	0.1944	0.1239	0.0755	0.0489	0.0291	0.0133

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	45.68%	36.66%	27.97%	18.95%	12.95%	9.31%	6.00%
	2	42.68%	34.78%	26.91%	18.43%	12.76%	9.19%	6.64%
	3	40.48%	32.58%	25.26%	17.52%	12.51%	9.16%	6.26%
	4	39.72%	32.17%	25.12%	17.89%	13.10%	9.60%	6.49%

POSTCONSTRUCTION

Summary of Data for section 48A504C
Analyzed by: on 07-01-1992

UNCORRECTED Overall Deflection Statistics

Mean Values (mils/kip)

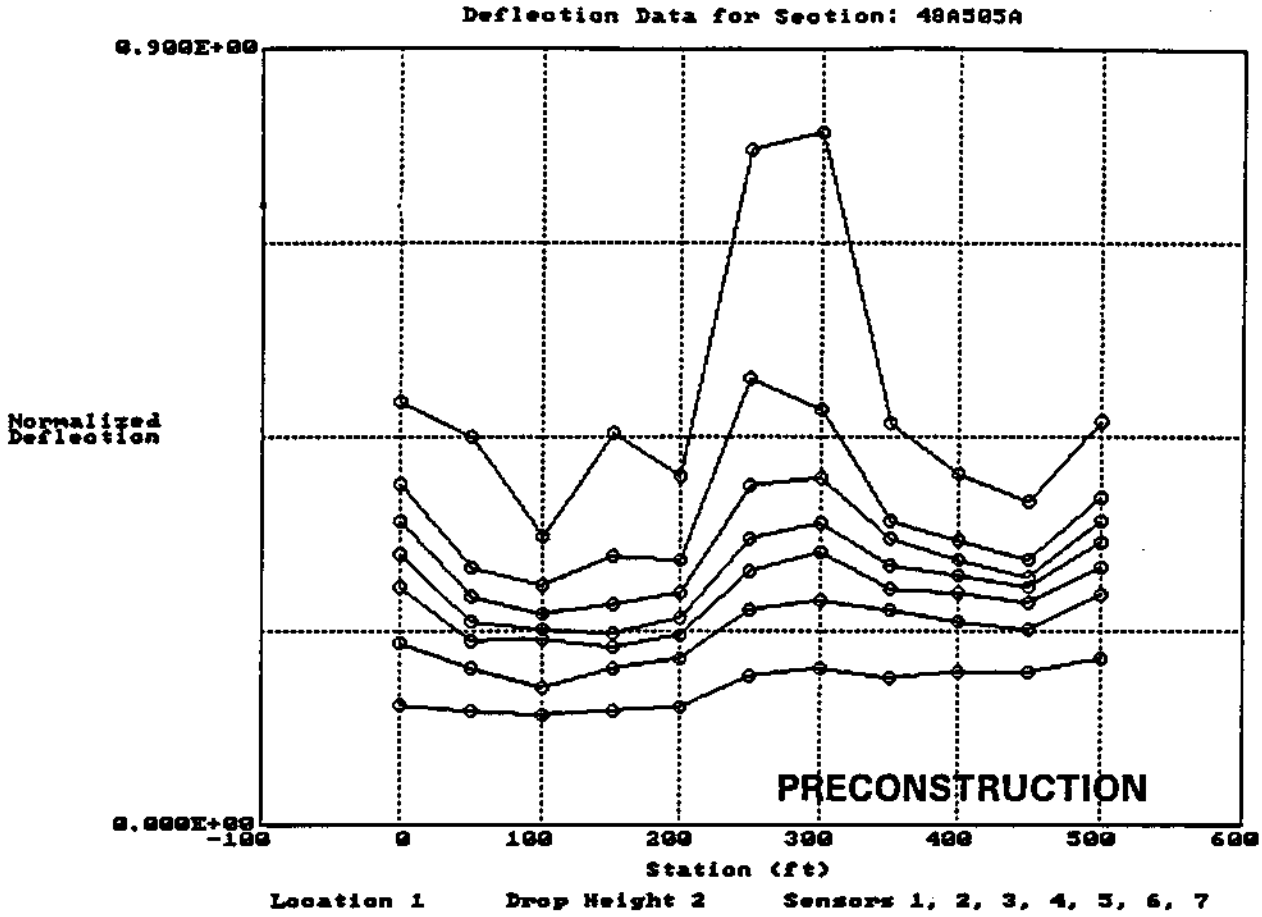
Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.3903	0.3249	0.2977	0.2698	0.2470	0.2067	0.1529
	2	0.3924	0.3283	0.3005	0.2732	0.2500	0.2096	0.1532
	3	0.3936	0.3266	0.2981	0.2712	0.2469	0.2072	0.1507
	4	0.3811	0.3158	0.2884	0.2617	0.2386	0.1993	0.1442

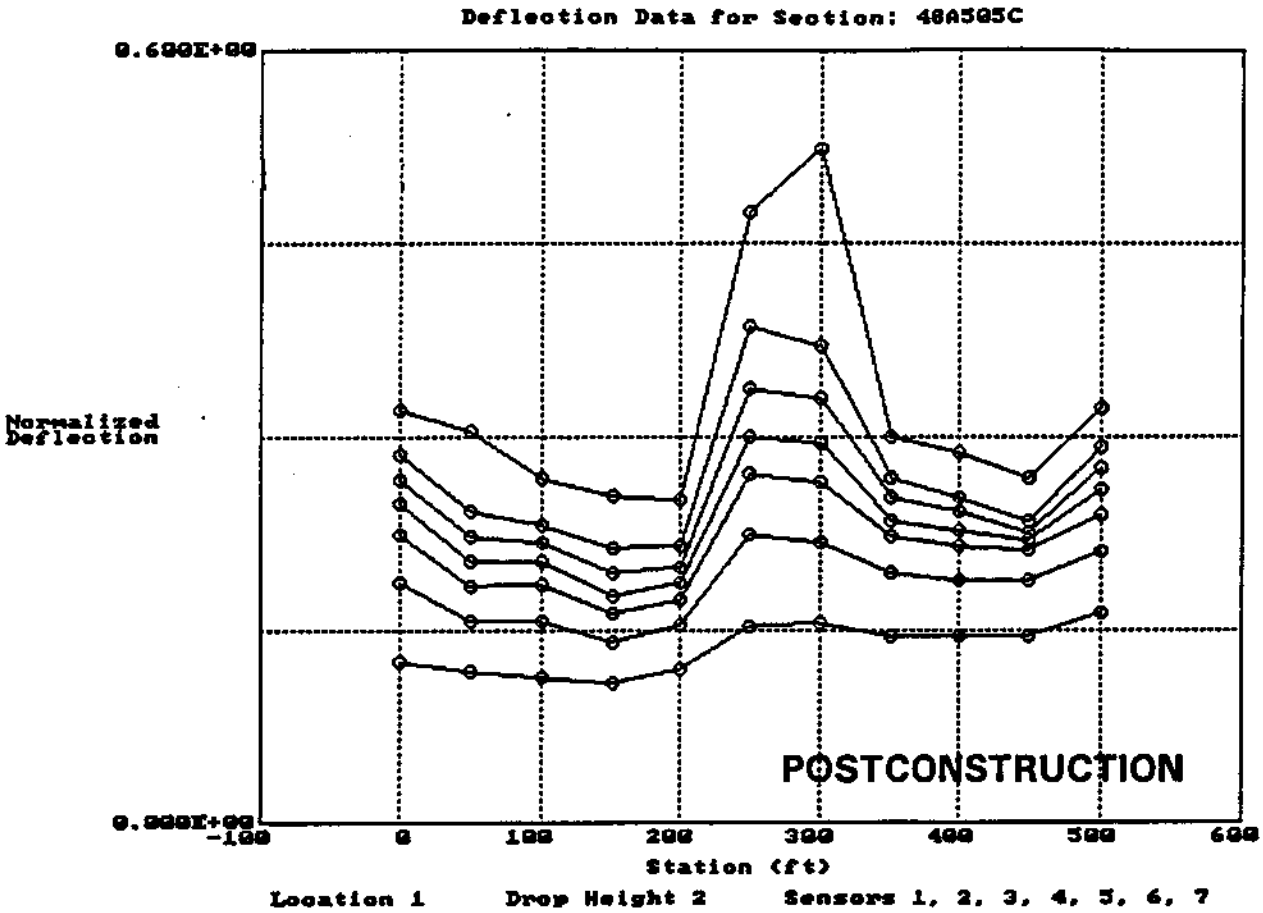
Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.0916	0.0771	0.0660	0.0529	0.0411	0.0236	0.0088
	2	0.0936	0.0806	0.0686	0.0549	0.0425	0.0254	0.0098
	3	0.0984	0.0846	0.0723	0.0582	0.0461	0.0277	0.0106
	4	0.0961	0.0829	0.0710	0.0572	0.0455	0.0268	0.0096

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	23.46%	23.74%	22.17%	19.63%	16.66%	11.40%	5.76%
	2	23.84%	24.55%	22.84%	20.08%	17.02%	12.13%	6.38%
	3	25.01%	25.89%	24.26%	21.46%	18.68%	13.35%	7.01%
	4	25.22%	26.25%	24.61%	21.85%	19.08%	13.45%	6.69%


Deflection Data for Section: 48A505A
0.900E+00
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
PRECONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7


Deflection Data for Section: 48A505C
0.600E+00
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
POSTCONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7

PRECONSTRUCTION

Summary of Data for section 48A505A
Analyzed by: on 07-01-1992

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	1	0.5046	0.3616	0.3124	0.2809	0.2617	0.2154	0.1609
	2	0.4946	0.3607	0.3158	0.2839	0.2594	0.2199	0.1587
	3	0.4809	0.3550	0.3105	0.2804	0.2583	0.2177	0.1590
	4	0.4687	0.3476	0.3041	0.2751	0.2531	0.2141	0.1552

Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.1619	0.0789	0.0542	0.0457	0.0405	0.0329	0.0253
	2	0.1546	0.0774	0.0553	0.0461	0.0388	0.0367	0.0244
	3	0.1475	0.0741	0.0531	0.0444	0.0385	0.0331	0.0250
	4	0.1437	0.0718	0.0510	0.0424	0.0371	0.0305	0.0233

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	32.09%	21.81%	17.36%	16.27%	15.49%	15.25%	15.72%
	2	31.26%	21.45%	17.52%	16.25%	14.94%	16.69%	15.35%
	3	30.67%	20.88%	17.09%	15.84%	14.90%	15.19%	15.69%
	4	30.66%	20.66%	16.77%	15.40%	14.66%	14.24%	14.99%

POSTCONSTRUCTION

Summary of Data for section 48A505C
Analyzed by: on 07-01-1992

UNCORRECTED Overall Deflection Statistics

Mean Values (mils/kip)

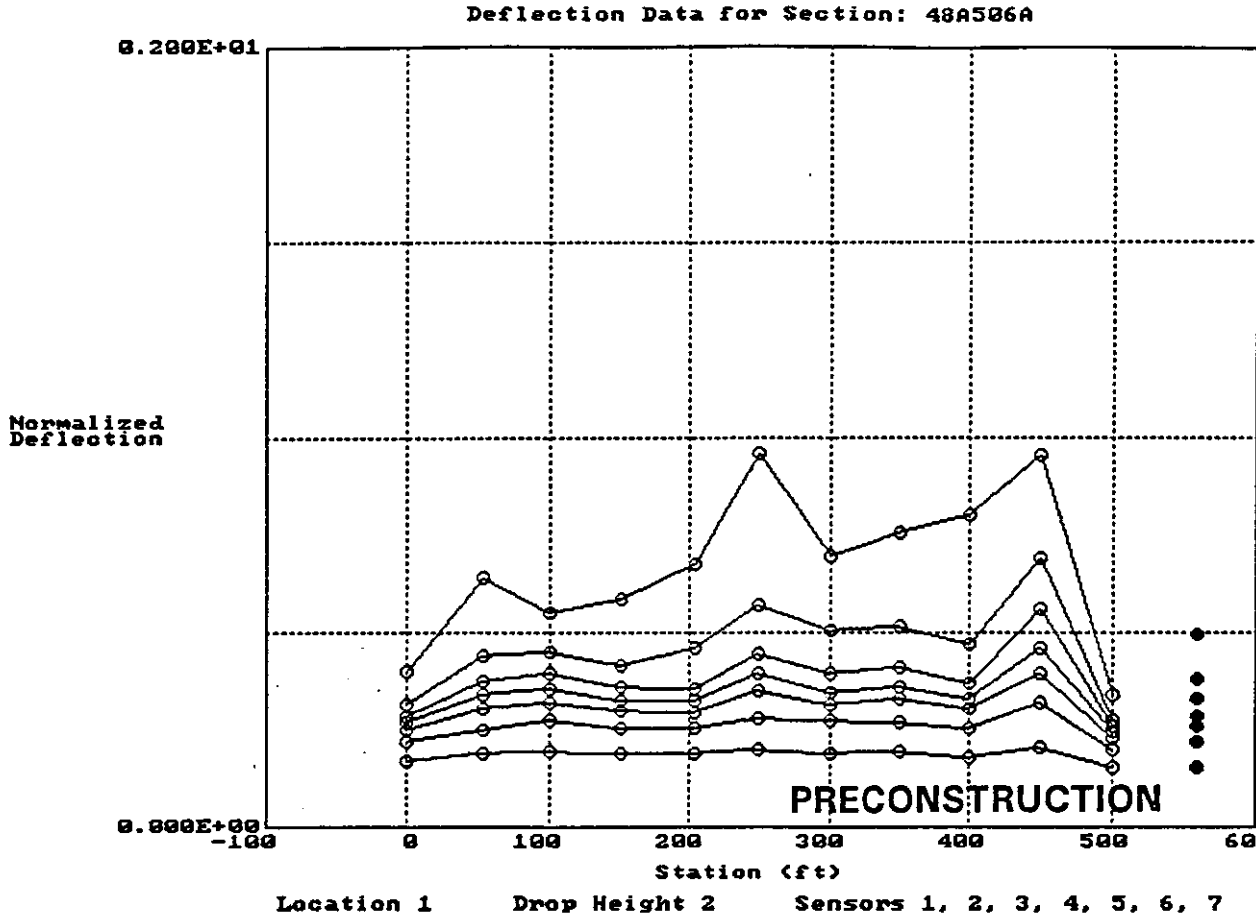
Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.3281	0.2755	0.2543	0.2348	0.2177	0.1857	0.1383
	2	0.3252	0.2726	0.2519	0.2327	0.2149	0.1840	0.1361
	3	0.3145	0.2630	0.2425	0.2244	0.2080	0.1776	0.1311
	4	0.3130	0.2602	0.2405	0.2225	0.2060	0.1761	0.1298

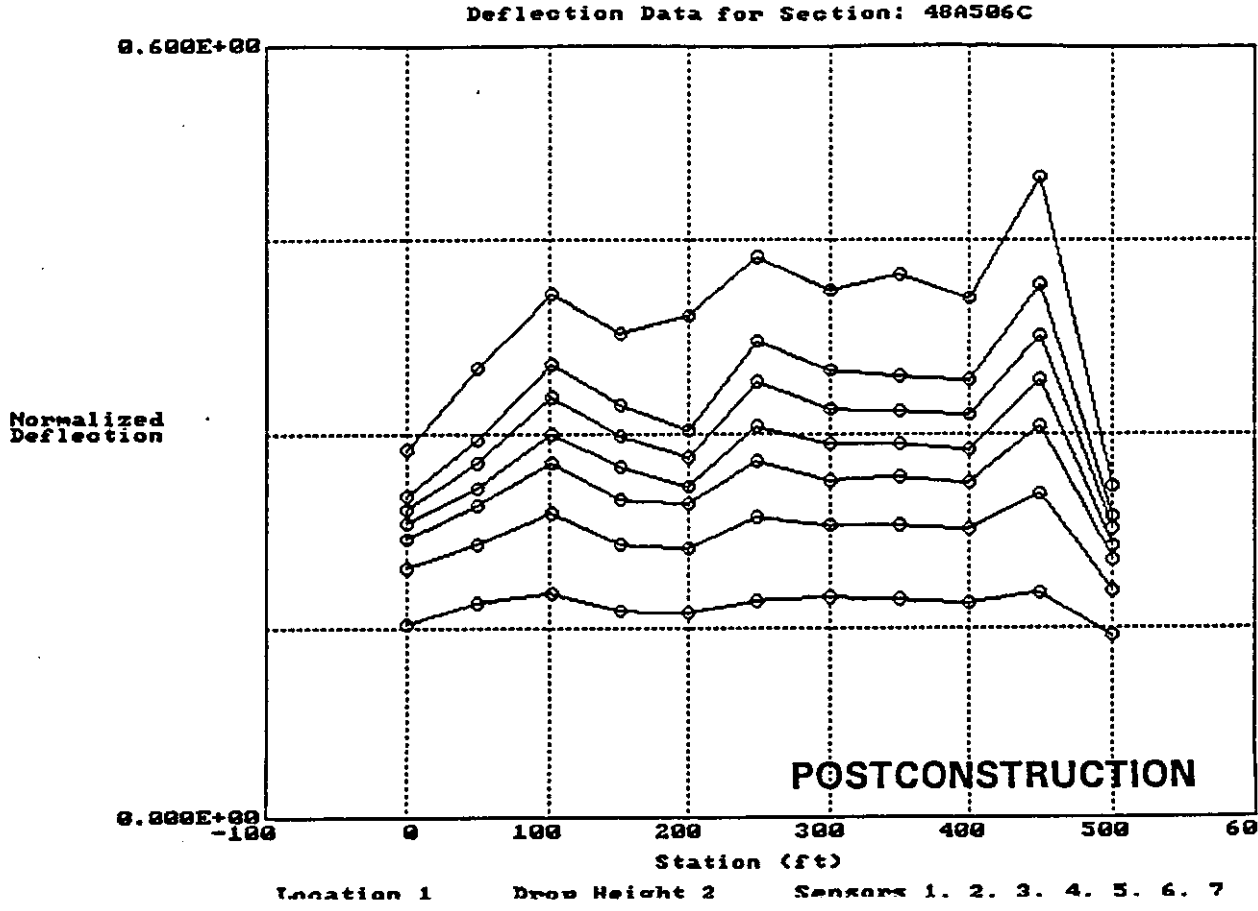
Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.0945	0.0601	0.0496	0.0429	0.0373	0.0288	0.0205
	2	0.0898	0.0581	0.0480	0.0405	0.0353	0.0284	0.0189
	3	0.0842	0.0540	0.0453	0.0381	0.0326	0.0255	0.0172
	4	0.0850	0.0546	0.0460	0.0388	0.0334	0.0258	0.0170

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	28.80%	21.82%	19.49%	18.27%	17.11%	15.53%	14.81%
	2	27.62%	21.30%	19.03%	17.41%	16.42%	15.42%	13.91%
	3	26.78%	20.53%	18.66%	16.99%	15.67%	14.38%	13.10%
	4	27.16%	20.97%	19.13%	17.44%	16.19%	14.65%	13.10%


Deflection Data for Section: 48A506A
0.200E+01
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
PRECONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7


Deflection Data for Section: 48A506C
0.600E+00
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
POSTCONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7

PRECONSTRUCTION

Summary of Data for section 48A506A
Analyzed by: on 07-01-1992

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
0	1	0.5066	0.3814	0.3313	0.2875	0.2606	0.2244	0.1630
	2	0.4926	0.3799	0.3277	0.2860	0.2588	0.2207	0.1571
	3	0.4904	0.3774	0.3269	0.2869	0.2626	0.2220	0.1587
	4	0.4735	0.3720	0.3228	0.2853	0.2607	0.2195	0.1568
1	1	0.6892	0.4680	0.3834	0.3409	0.3088	0.2578	0.1869
	2	0.6684	0.4644	0.3827	0.3413	0.3080	0.2597	0.1877
	3	0.6547	0.4536	0.3768	0.3370	0.3056	0.2553	0.1843
	4	0.6407	0.4467	0.3728	0.3343	0.3027	0.2532	0.1819

Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
0	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	1	0.2116	0.1137	0.0768	0.0574	0.0454	0.0280	0.0141
	2	0.1982	0.1137	0.0791	0.0577	0.0442	0.0310	0.0148
	3	0.1918	0.1101	0.0778	0.0594	0.0473	0.0307	0.0156
	4	0.1875	0.1108	0.0798	0.0609	0.0492	0.0331	0.0171

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
0	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1	1	30.70%	24.28%	20.02%	16.83%	14.69%	10.87%	7.52%
	2	29.65%	24.48%	20.66%	16.90%	14.33%	11.92%	7.90%
	3	29.30%	24.27%	20.66%	17.62%	15.49%	12.01%	8.47%
	4	29.27%	24.81%	21.41%	18.21%	16.24%	13.06%	9.43%

POSTCONSTRUCTION

Summary of Data for section 48A506C
Analyzed by: on 07-01-1992

UNCORRECTED Overall Deflection Statistics

Mean Values (mils/kip)

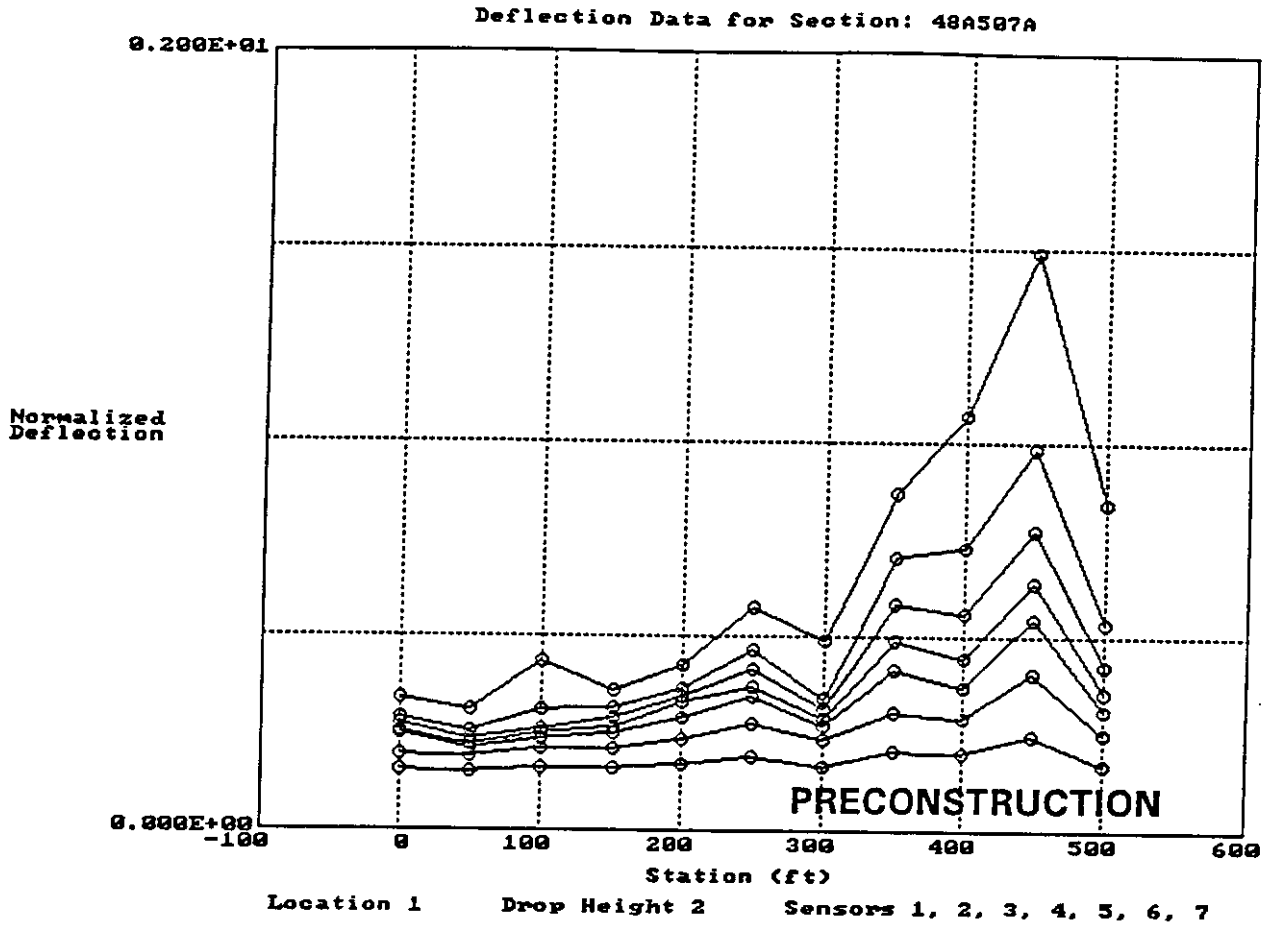
Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.3888	0.3266	0.3032	0.2774	0.2565	0.2193	0.1668
	2	0.3863	0.3261	0.3022	0.2781	0.2562	0.2207	0.1667
	3	0.3816	0.3184	0.2946	0.2710	0.2501	0.2140	0.1607
	4	0.3648	0.3038	0.2811	0.2590	0.2389	0.2044	0.1527

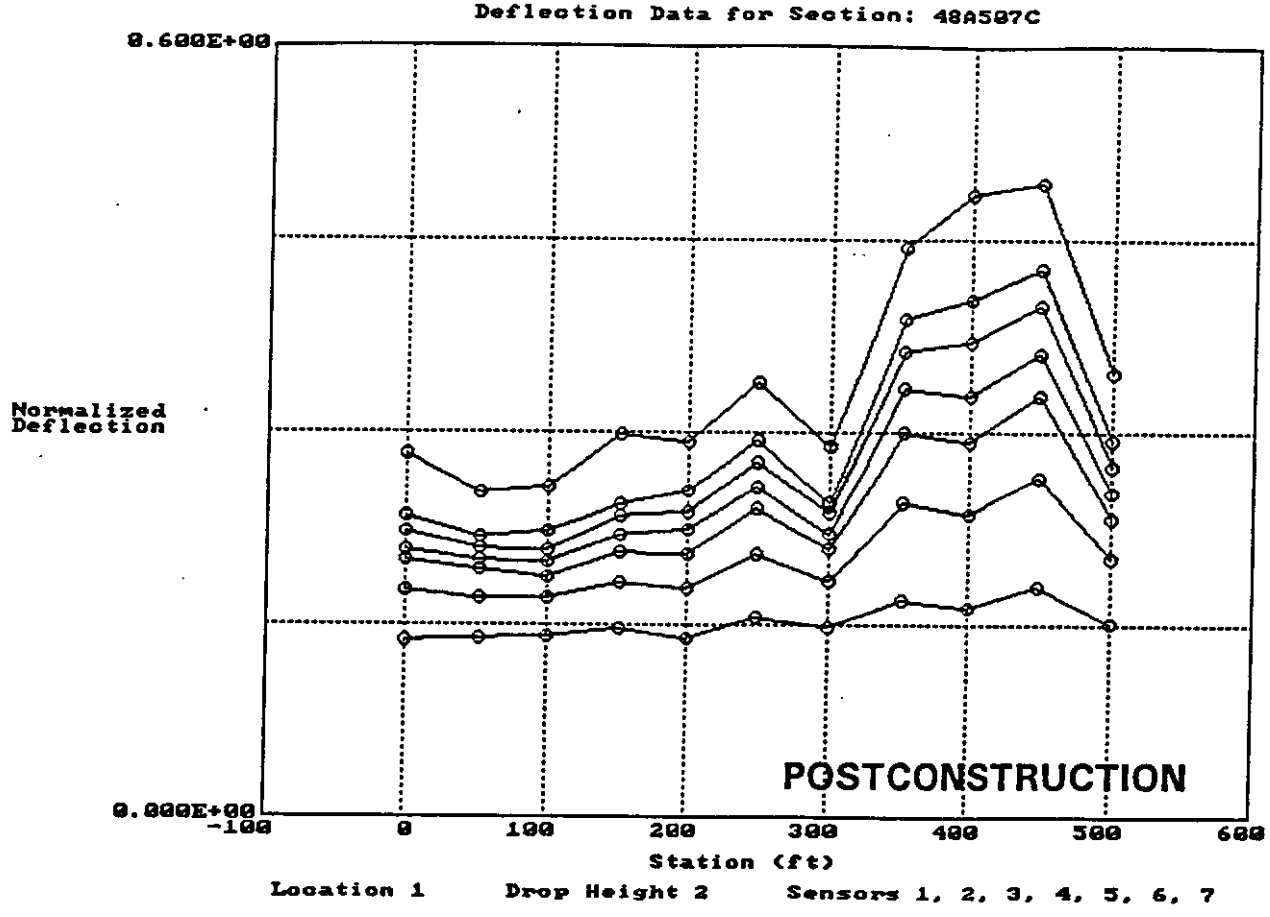
Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.0682	0.0523	0.0438	0.0365	0.0289	0.0198	0.0122
	2	0.0669	0.0522	0.0435	0.0362	0.0288	0.0208	0.0104
	3	0.0675	0.0525	0.0446	0.0366	0.0299	0.0208	0.0116
	4	0.0635	0.0492	0.0420	0.0343	0.0280	0.0194	0.0107

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	17.55%	16.03%	14.43%	13.17%	11.28%	9.04%	7.33%
	2	17.31%	16.01%	14.38%	13.02%	11.24%	9.44%	6.22%
	3	17.69%	16.50%	15.14%	13.49%	11.94%	9.72%	7.23%
	4	17.41%	16.18%	14.93%	13.24%	11.71%	9.48%	7.03%


Deflection Data for Section: 48A507A
0.200E+01
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
PRECONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7


Deflection Data for Section: 48A507C
0.600E+00
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
POSTCONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7

PRECONSTRUCTION

Summary of Data for section 48A507A
Analyzed by: on 07-01-1992

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	1	0.6739	0.4844	0.4078	0.3554	0.3173	0.2529	0.1819
	2	0.6560	0.4813	0.4072	0.3558	0.3169	0.2542	0.1798
	3	0.6461	0.4754	0.4033	0.3532	0.3150	0.2532	0.1796
	4	0.6370	0.4698	0.3995	0.3506	0.3152	0.2506	0.1812

Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.3893	0.2395	0.1709	0.1286	0.1003	0.0647	0.0300
	2	0.3733	0.2331	0.1687	0.1263	0.0981	0.0631	0.0285
	3	0.3520	0.2229	0.1623	0.1217	0.0949	0.0608	0.0277
	4	0.3395	0.2178	0.1590	0.1203	0.0953	0.0597	0.0299

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	57.77%	49.43%	41.91%	36.17%	31.61%	25.57%	16.51%
	2	56.90%	48.43%	41.42%	35.49%	30.95%	24.80%	15.85%
	3	54.48%	46.88%	40.24%	34.45%	30.14%	23.99%	15.41%
	4	53.30%	46.36%	39.79%	34.30%	30.23%	23.84%	16.49%

POSTCONSTRUCTION

Summary of Data for section 48A507C
Analyzed by: on 07-01-1992

UNCORRECTED Overall Deflection Statistics

Mean Values (mils/kip)

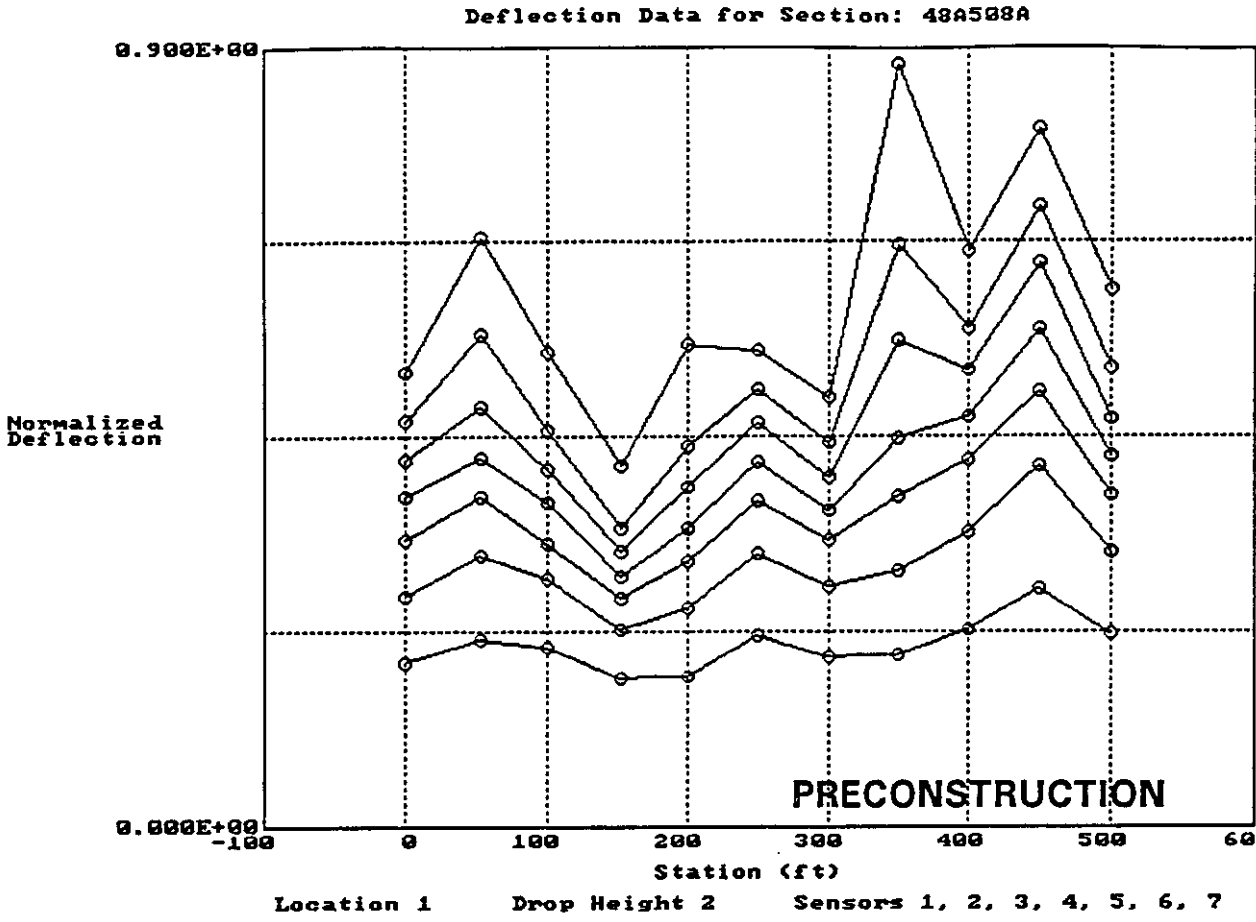
Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.3448	0.2931	0.2751	0.2556	0.2361	0.2016	0.1518
	2	0.3440	0.2936	0.2761	0.2555	0.2363	0.2019	0.1522
	3	0.3381	0.2863	0.2683	0.2492	0.2309	0.1967	0.1465
	4	0.3242	0.2741	0.2565	0.2379	0.2205	0.1871	0.1390

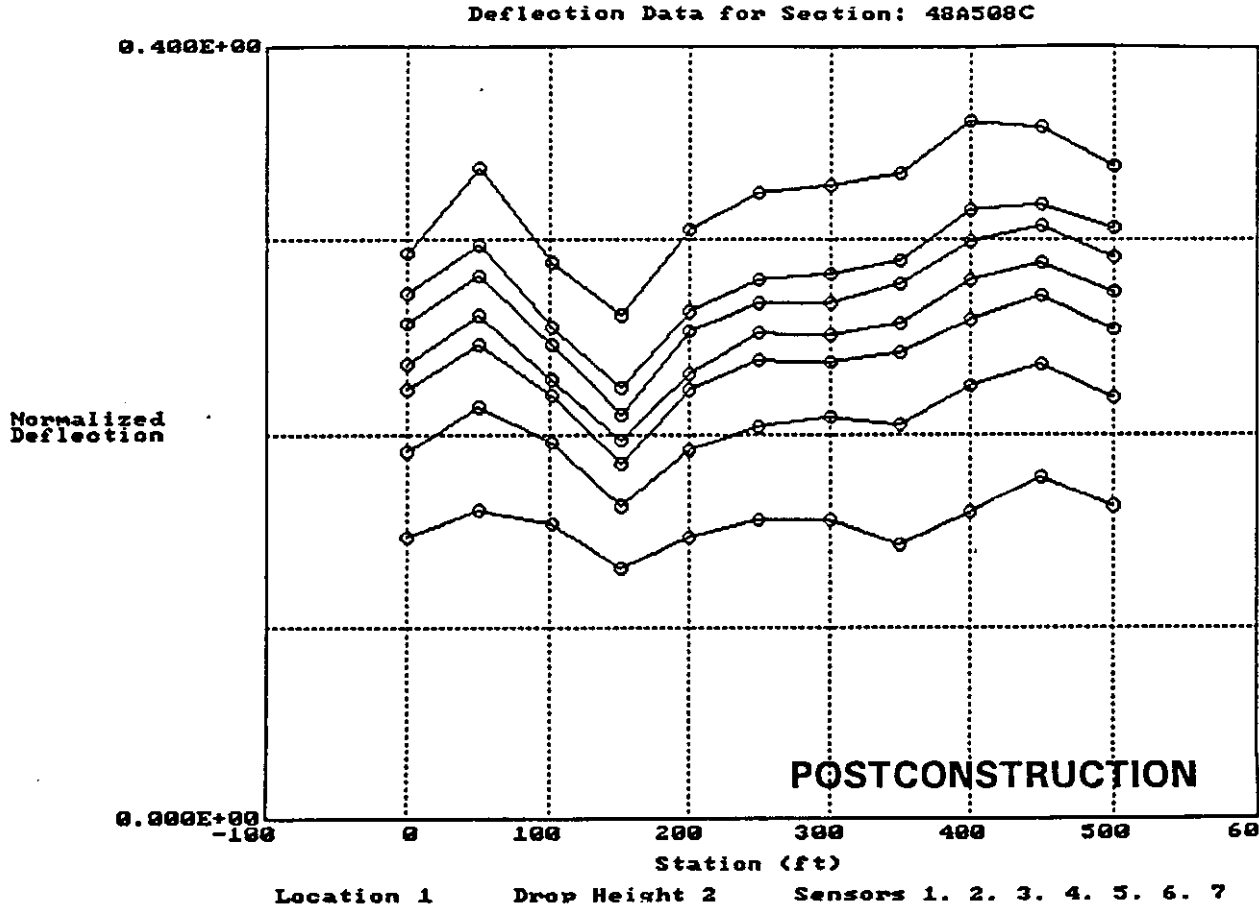
Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.0913	0.0781	0.0690	0.0601	0.0488	0.0330	0.0159
	2	0.0890	0.0768	0.0690	0.0588	0.0488	0.0332	0.0138
	3	0.0901	0.0772	0.0688	0.0588	0.0488	0.0327	0.0147
	4	0.0863	0.0747	0.0666	0.0563	0.0473	0.0323	0.0140

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	26.49%	26.64%	25.06%	23.52%	20.67%	16.38%	10.44%
	2	25.88%	26.16%	24.98%	23.00%	20.65%	16.47%	9.07%
	3	26.65%	26.95%	25.65%	23.58%	21.12%	16.64%	10.02%
	4	26.61%	27.24%	25.97%	23.65%	21.44%	17.27%	10.09%


Deflection Data for Section: 48A508A
0.900E+00
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
PRECONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7


Deflection Data for Section: 48A508C
0.400E+00
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
POSTCONSTRUCTION
Location 1
Drop Height 2
Sensors 1. 2. 3. 4. 5. 6. 7

PRECONSTRUCTION

Summary of Data for section 48A508A
Analyzed by: on 07-01-1992

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	1	0.6109	0.5178	0.4599	0.4070	0.3611	0.2969	0.2044
	2	0.6126	0.5192	0.4642	0.4106	0.3638	0.3001	0.2086
	3	0.6119	0.5169	0.4618	0.4102	0.3645	0.2987	0.2065
	4	0.6062	0.5113	0.4587	0.4078	0.3621	0.2972	0.2032

Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.1436	0.1102	0.0949	0.0768	0.0646	0.0503	0.0286
	2	0.1376	0.1080	0.0913	0.0751	0.0638	0.0503	0.0289
	3	0.1371	0.1061	0.0908	0.0746	0.0628	0.0482	0.0265
	4	0.1404	0.1040	0.0904	0.0746	0.0638	0.0492	0.0276

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	23.51%	21.28%	20.64%	18.86%	17.90%	16.95%	14.01%
	2	22.45%	20.79%	19.67%	18.29%	17.52%	16.77%	13.87%
	3	22.41%	20.53%	19.66%	18.18%	17.24%	16.13%	12.85%
	4	23.17%	20.34%	19.70%	18.29%	17.61%	16.56%	13.57%

POSTCONSTRUCTION

Summary of Data for section 48A508C
Analyzed by: on 07-01-1992

UNCORRECTED Overall Deflection Statistics

Mean Values (mils/kip)

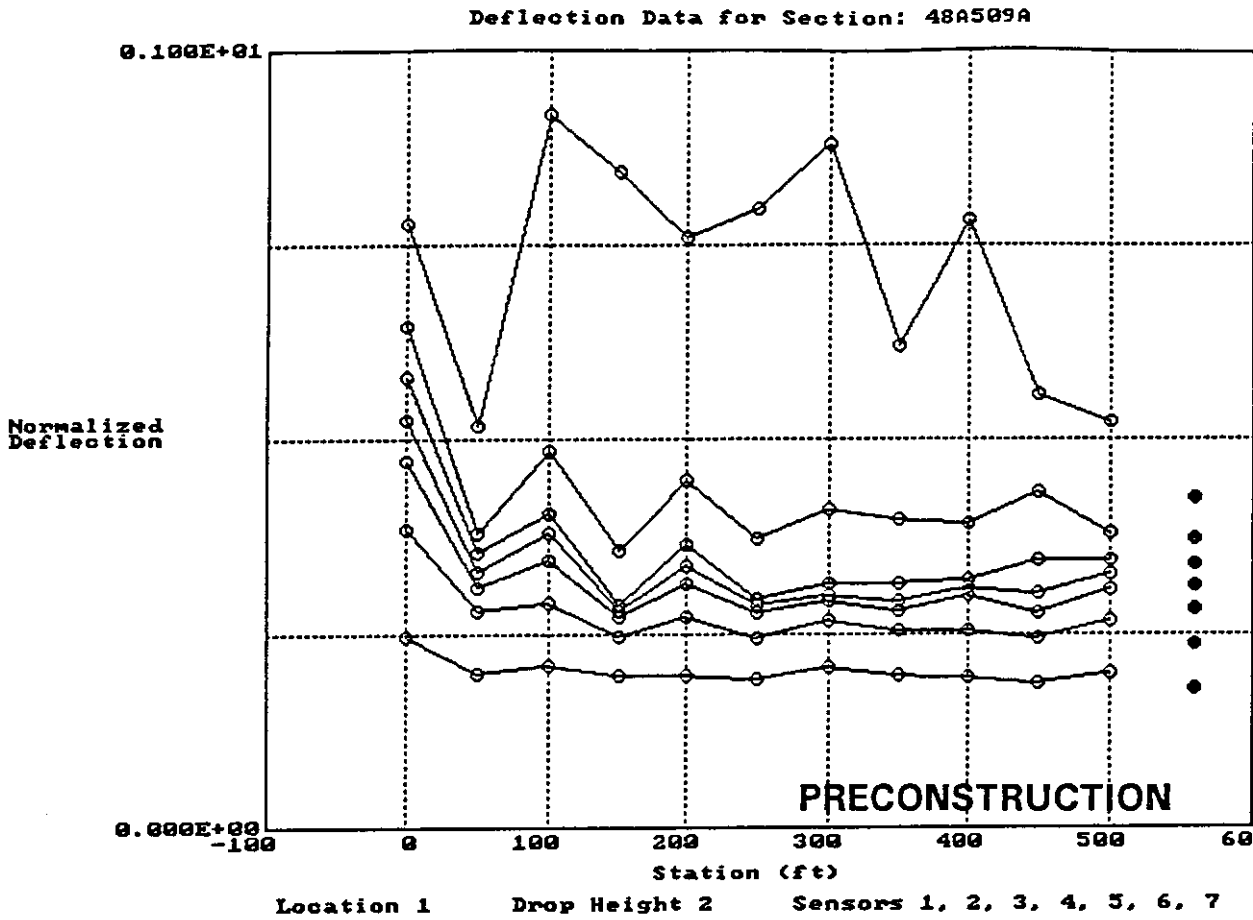
Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.3180	0.2778	0.2639	0.2460	0.2328	0.2013	0.1518
	2	0.3207	0.2819	0.2686	0.2501	0.2362	0.2049	0.1540
	3	0.3183	0.2762	0.2625	0.2448	0.2312	0.2007	0.1502
	4	0.3104	0.2694	0.2549	0.2383	0.2243	0.1939	0.1442

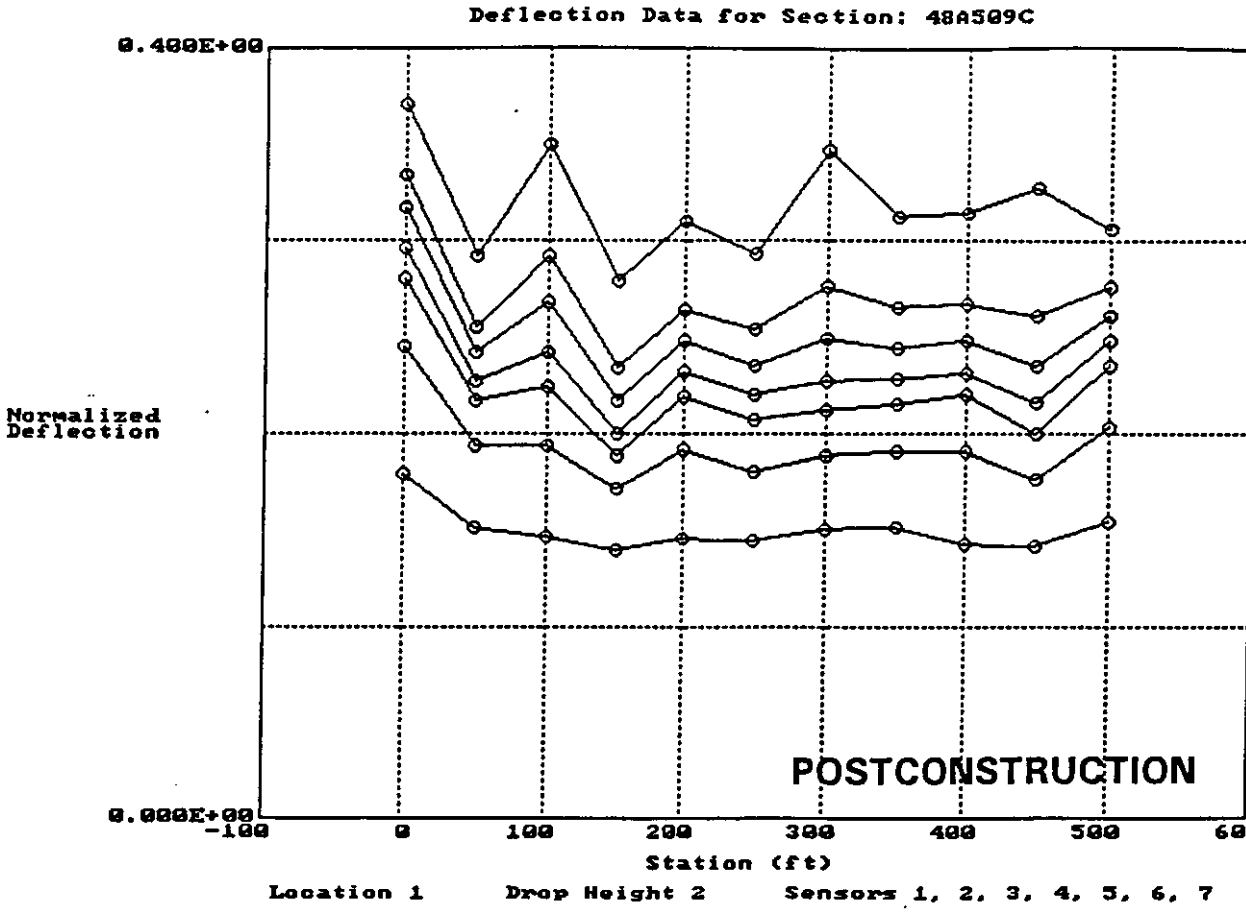
Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.0326	0.0292	0.0276	0.0269	0.0237	0.0184	0.0131
	2	0.0307	0.0280	0.0272	0.0262	0.0234	0.0196	0.0122
	3	0.0294	0.0283	0.0275	0.0259	0.0237	0.0188	0.0125
	4	0.0295	0.0277	0.0269	0.0248	0.0231	0.0180	0.0118

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	10.26%	10.51%	10.44%	10.93%	10.19%	9.14%	8.65%
	2	9.57%	9.93%	10.14%	10.47%	9.91%	9.56%	7.90%
	3	9.25%	10.26%	10.49%	10.57%	10.23%	9.39%	8.35%
	4	9.51%	10.28%	10.55%	10.42%	10.30%	9.28%	8.17%


Deflection Data for Section: 48A509A
0.100E+01
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
PRECONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7


Deflection Data for Section: 48A509C
0.400E+00
Normalized Deflection
0.000E+00
-100
0
100
200
300
400
500
600
Station (ft)
POSTCONSTRUCTION
Location 1
Drop Height 2
Sensors 1, 2, 3, 4, 5, 6, 7

PRECONSTRUCTION

Summary of Data for section 48A509A
Analyzed by: on 07-01-1992

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
0	1	0.4250	0.3876	0.3475	0.3198	0.2862	0.2423	0.1869
	2	0.4250	0.3729	0.3392	0.3137	0.2820	0.2381	0.1808
	3	0.4353	0.3803	0.3450	0.3192	0.2857	0.2430	0.1845
	4	0.4165	0.3551	0.3255	0.3032	0.2813	0.2331	0.1753
1	1	0.7429	0.4276	0.3562	0.3342	0.3143	0.2701	0.2051
	2	0.7254	0.4270	0.3570	0.3339	0.3138	0.2737	0.2028
	3	0.7073	0.4181	0.3517	0.3286	0.3092	0.2691	0.1990
	4	0.6935	0.4101	0.3456	0.3235	0.3039	0.2629	0.1942

Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
0	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	1	0.1612	0.0773	0.0774	0.0668	0.0553	0.0393	0.0143
	2	0.1456	0.0810	0.0812	0.0695	0.0570	0.0396	0.0164
	3	0.1386	0.0820	0.0813	0.0700	0.0584	0.0398	0.0174
	4	0.1332	0.0841	0.0831	0.0716	0.0596	0.0415	0.0183

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
0	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1	1	21.70%	18.08%	21.74%	19.98%	17.60%	14.57%	6.97%
	2	20.08%	18.96%	22.75%	20.81%	18.15%	14.47%	8.09%
	3	19.59%	19.62%	23.11%	21.30%	18.87%	14.80%	8.76%
	4	19.21%	20.51%	24.04%	22.13%	19.60%	15.81%	9.41%

POSTCONSTRUCTION

Summary of Data for section 48A509C
Analyzed by: on 07-01-1992

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	1	0.3171	0.2707	0.2524	0.2333	0.2195	0.1941	0.1499
	2	0.3183	0.2707	0.2514	0.2333	0.2197	0.1934	0.1502
	3	0.3161	0.2668	0.2468	0.2297	0.2155	0.1895	0.1474
	4	0.3012	0.2526	0.2340	0.2176	0.2041	0.1794	0.1379

Standard Deviations

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	0.0280	0.0257	0.0260	0.0258	0.0239	0.0195	0.0121
	2	0.0279	0.0255	0.0257	0.0245	0.0233	0.0193	0.0111
	3	0.0291	0.0272	0.0270	0.0260	0.0244	0.0200	0.0122
	4	0.0299	0.0273	0.0271	0.0260	0.0240	0.0195	0.0114

Coefficient of Variation

Test Loc.	Drop Ht	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
1	1	8.82%	9.51%	10.31%	11.07%	10.87%	10.03%	8.09%
	2	8.77%	9.43%	10.21%	10.50%	10.63%	9.96%	7.36%
	3	9.21%	10.19%	10.96%	11.32%	11.34%	10.57%	8.28%
	4	9.94%	10.79%	11.59%	11.94%	11.76%	10.86%	8.25%

APPENDIX D

MATERIALS SAMPLING & TESTING PLANS AND DATA

NATIONAL RESEARCH COUNCIL

STRATEGIC HIGHWAY RESEARCH PROGRAM

Southern Region, 8240 MoPac Expressway, Suite 250, Austin, TX 78759 Tel. (512) 346-7477 Fax (512) 346-8750

HOMER G. WHEELER
Regional Engineer

February 3, 1992

Dr. Amir N. Hanna
Strategic Highway Research Program
818 Connecticut Avenue NW - 4th Floor
Washington, DC 20006

Subject: Postconstruction Sampling Concerns on Test Section 48A500 in Kaufman, Texas.

Dear Amir,

After completion of our test sections at this location on US-175 in Kaufman, Texas, in October 1991, we began coordinating with the state personnel in the Dallas District regarding the postconstruction sampling of this project. As is customary, it was decided that no sampling could be done until the contractor completed the remaining portion of the job and it was approved by the state. Jerry Daleiden from our office continued to check back with the state on the status of this work, noting his interest in the postconstruction sampling and his desire to participate in this activity. In mid to late December, however, we were informed that not only had the construction been completed, but the postconstruction sampling as well. We were assured by the Dallas District Lab Engineer that all the sampling was conducted in accordance with the sampling plan provided. During a recent visit to the Dallas area, one of our Field Technicians was encouraged to go by these test sections just to make sure. His observations were somewhat unsettling. Twenty of the thirty-six cores requested for postconstruction sampling are located within test sections. In addition, thirteen 6″ cores and three extra 4″ cores were noted along the mid-lane of test section 48A507 (see attached diagram of actual core-hole locations).

Although we feel that not much can be done at this point to rectify this problem, we did wish to bring it to your attention, and solicit any suggestions you might have for dealing with this dilemma and avoiding similar problems in the future.

The core-holes still appear to be distributed well enough that the test sections will be adequately represented; however, thickness information from these cores will need to be carefully evaluated and processed. Fortunately, a significant amount of thickness information for each of these test sections has been made available through rod and level shots taken throughout the construction of these test sections. All of the testing proposed should still be applicable for these cores as taken. We would also anticipate that any distress associated with these core-hole locations in the test sections would be disregarded

in the analysis. Finally, we strongly recommend that for future projects, SHRP and/or the FHWA should maintain responsibility for coordination of these sampling activities. The state did "almost" everything we could have asked them to do to ensure the sampling and testing was conducted in accordance with SHRP guidelines (including contracting with Southwestern Labs for the accomplishment of this task). Even with all of that effort, the final results were not quite what we would have hoped for.

Please let us know what suggestions, if any, you may have for addressing the anomalies discussed above for test sections 48A500 and/or means to improve future coordination of these activities.

Sincerely,

Homer

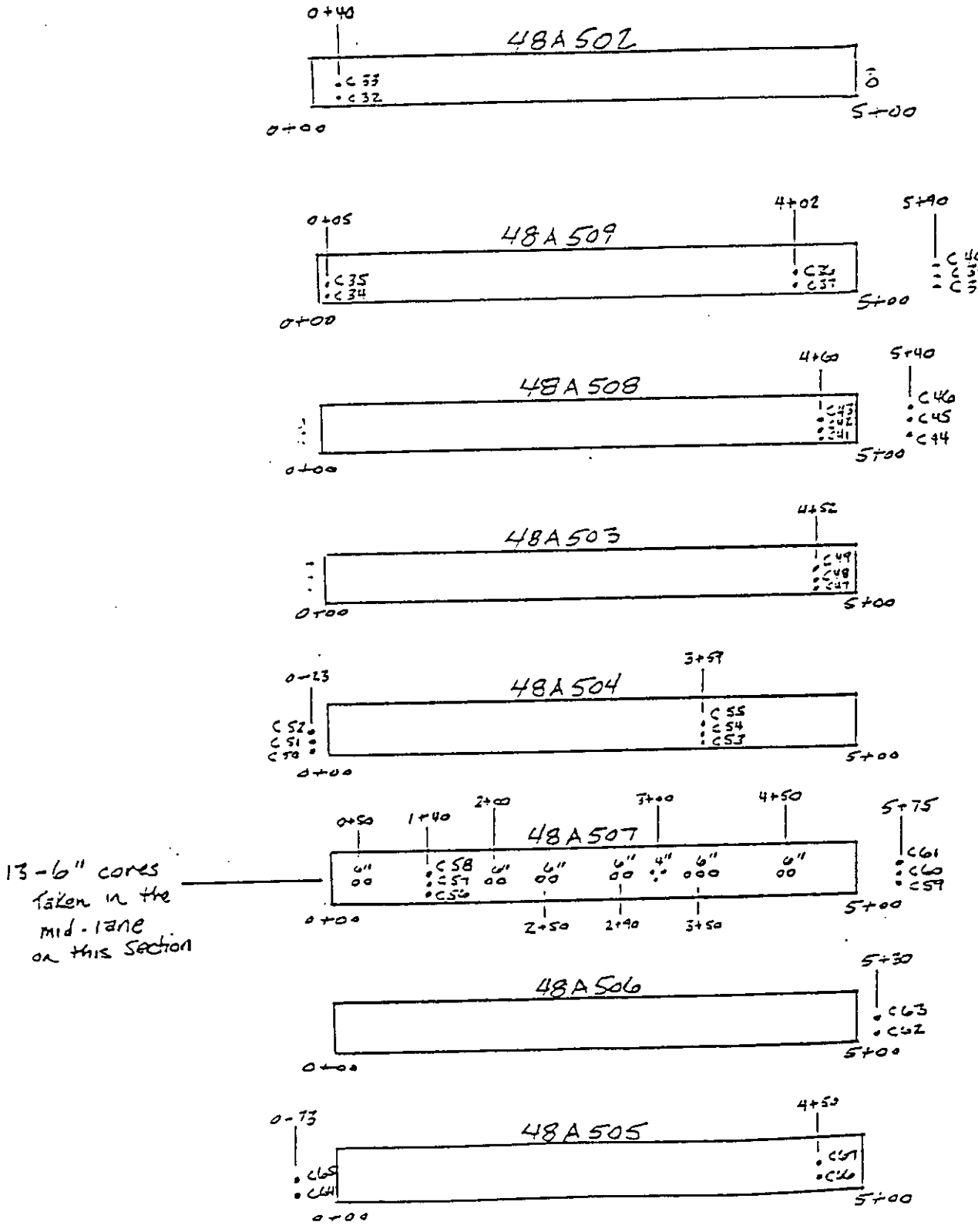
Homer G. Wheeler, P.E.
SHRP Regional Engineer, SRCO

HGW:dmj

Attachment: As stated.

cc.w/Attach: Fred Martinez, SwL
James L. Brown, TX-DOT
Brent Rauhut, PM-SRCO

Location of Core Holes
Post-Construction
SPS-5 - Kaufman, TX



	core offset (ft.)	station #	reference section #
#1-C32	3	0+40	48A502
2-C33	6	0+40	48A502
3-C34	3	0+05	48A509
4-C35	6	0+05	48A509
5-C36	3	4+02	48A509
6-C37	6	4+02	48A509
7-C38	2	5+90	48A509
8-C39	3.5	5+90	48A509
9-C40	5	5+90	48A509
10-C41	2	4+60	48A508
11-C42	3.5	4+60	48A508
12-C43	5	4+60	48A508
13-C44	2	5+40	48A508
14-C45	3.5	5+40	48A508
15-C46	5	5+40	48A508
16-C47	2	4+52	48A503
17-C48	3.5	4+52	48A503
18-C49	5	4+52	48A503
19-C50	2	0-23	48A504
20-C51	3.5	0-23	48A504
21-C52	5	0-23	48A504
22-C53	2	3+59	48A504
23-C54	3.5	3+59	48A504
24-C55	5	3+59	48A504
25-C56	2	1+40	48A507
26-C57	3.5	1+40	48A507
27-C58	5	1+40	48A507
28-C59	2	5+75	48A507
29-C60	3.5	5+75	48A507
30-C61	5	5+75	48A507
31-C62	3	5+30	48A506
32-C63	6	5+30	48A506
33-C64	3	0-73	48A505
34-C65	6	0-73	48A505
35-C66	3	4+50	48A505
36-C67	6	4+50	48A505

Brent Rauhut Engineering Inc.

January 24, 1991

Mr. Charles Little
Supervising Laboratory Engineer
Texas State Department of Highways
and Public Transportation
Dallas District
P.O. Box 3067
Dallas, Texas 75221

Subject: Materials Sampling and Testing for SHRP Site on US-175 in Kaufman County.

Dear Mr. Little:

Attached please find the up-dated Tables 1 through 3, revised to reflect our discussions of January 23. In general, the tables have been corrected to show that both asphalt surface and the asphalt base will be sampled and tested as asphalt layers. For our purposes, the designations of unbound base/subbase layers will not be applicable. The lime-treated flexible base will be designated as a bound base.

For the volumes of the bulk samples of the subgrade (lime-treated and natural), 200 lbs. should be collected per sample, or 400 lbs. per test pit per layer. The moisture content samples are 1-quart jars. Two of these 1-quart moisture content samples should be collected per test pit per subgrade layer. Two thin-walled tubes should be pushed at each of the 6" diameter auger holes (A1-A3), one on top of the other. These tube samples will be used to conduct the resilient modulus tests (Protocol P-46), for each of the subgrade layers (natural and lime-stabilized).

To clarify the bulk sampling during construction under Part B of Table 2, Item #1 should refer to the virgin asphalt cement added to the virgin mix, Item #2 should refer to the virgin asphalt cement added to the recycled mix, Item #3 should refer to the virgin aggregate (uncombined), as we discussed. The separate components of this virgin aggregate should be placed in individual 55 gal. drums with the total weight of the components adding up to 1,000 lbs.

All of these clarifications should be reflected in the revised tables shown in the attached. Please feel free to contact me if you find any additional clarifications or revisions that appear warranted, or if there is anything else I can provide to you to assist in this effort. Your assistance in this endeavor is greatly appreciated.

Sincerely,

Jerry F. Daleiden, P.E.
Project Engineer, SRCO

Attachments: As stated above.

cc.w/Attach: James Sassin, TX SDHPT-D8PD
Ken Boehme, TX SDHPT-Kaufman Residency
Bob Scott, SWL-Dallas
Paul Smith, SWL-Dallas

JFD:dmj

TABLE 1. SCOPE OF MATERIALS SAMPLING AND FIELD TESTING

MATERIAL & SAMPLING DESCRIPTION	NUMBER OF MATERIAL SAMPLES	SAMPLE TYPE DESIGNATION
PRE-CONSTRUCTION SAMPLING		
1. Asphalt Concrete (Including Both AC Surface & Base)		
Coring - 4" diam. cores	31	C1-C31
Coring - 6" diam. cores	3	A1-A3
Bulk Sampling (12" × 12" Slab)	6	TP1, TP2, TP3
2. Unbound Base/Subbase Layers		
Not Applicable		
3. Bound Base/Subbase Layers (Per Layer)		
Coring - 4" diam. cores	6	C6,C7,C15,C16,C26,C27
Coring - 6" diam. cores	3	A1-A3
Bulk Sampling (12" × 12" Slabs)	6	TP1, TP2, TP3
In Situ Density & Moisture Content (Nuclear Gauge)	6	TP1, TP2, TP3
Moisture Content Samples	6	TP1, TP2, TP3
4. Subgrade (Lime-Treated & Natural) (The 2 layers will be sampled & tested separately)		
Splitspoon Sampling	6*	A1-A3
Thin-walled Tube Sampling (* 2 tubes or 2 spoons or combination per hole)	6*	A1-A3
Bulk Sampling in Test Pits (200 lb. samples)	6	TP1, TP2, TP3
In Situ Density & Moisture Content (Nuclear Gauge)	6	TP1, TP2, TP3
Moisture Content Samples (1 qt. jars)	6	TP1, TP2, TP3
5. Shoulder Auger Probes	3	S1-S3
POST-CONSTRUCTION SAMPLING		
1. Asphaltic Concrete (Overlay)		
Coring - 4" diam. cores	36	C32-C67

TABLE 2. BULK MATERIAL SAMPLING DURING CONSTRUCTION

A. Materials to be Tested as a Part of LTPP.

MATERIAL & SAMPLING DESCRIPTION	NUMBER OF MATERIAL SAMPLES	SAMPLE LOCATION
1. Virgin Asphalt Concrete Mix	100 lb.	Mix Plant
2. Recycled Asphalt Concrete Mix	100 lb.	Mix Plant

B. Materials to be Shipped to the SHRP Asphalt Reference Library.

MATERIAL & SAMPLING DESCRIPTION	NUMBER OF MATERIAL SAMPLES	SAMPLE LOCATION
1. Virgin Asphalt Cement Used in Virgin Mix *5 Gallon Containers*	*11*	*Mix Plant*
2. Virgin Asphalt Cement Used in Recycled Mix 5 Gallon Containers	11	Mix Plant
3. Virgin Aggregate (Uncombined) Used in Virgin Mix (55 gal. drums) Used in Recycled Mix (55 gal. drums)	 1000 lbs. 1000 lbs.	 Mix Plant Mix Plant
4. Recycled Asphaltic Concrete (Prior to Remixing)	1000 lbs.	Mix Plant
5. Finished Asphaltic Concrete Mix Virgin AC Mix Recycled AC Mix	 200 lbs. 200 lbs.	 Mix Plant Mix Plant

TABLE 3. 48A5 LABORATORY TESTING PLANS (PRE-CONSTRUCTION)

MATERIAL TYPE AND PROPERTIES	SHRP TEST DESIGNATION	SHRP PROTOCOL	NO. OF TESTS PER LAYER	MATERIAL SOURCE/ SAMPLE TYPE DESIGNATION
PRE-CONSTRUCTION				
I. ASPHALT CONCRETE: (All tests will be conducted individually for both the AC surface and the AC base)				
A. ASPHALTIC CONCRETE:				
Core Examination/Thickness	AC01	P01	31	All C-Type Cores
Bulk Specific Gravity	AC02	P02	9	[C5,C6,C7],[C14,C15,C16], [C25,C26,C27] (Note 3)
Maximum Specific Gravity	AC03	P03	3	TP1,TP2,TP3
Asphalt Content (Extraction)	AC04	P04	3	TP1,TP2,TP3
Creep Compliance	AC06	P06	3	C3,C13,C29 (Note 1)
Resilient Modulus	AC07	P07	6	[C6,C7],[C15,C16],[C26,C27]
Tensile Strength	AC07	P07	9	[C5,C6,C7],[C14,C15,C16], [C25,C26,C27]
Field Moisture Damage	AC08	P08	3	A1,A2,A3
B. EXTRACTED AGGREGATE:				
Type and Classification:				
Coarse Aggregate	AG03	P13	3	TP1,TP2,TP3
Find Aggregate	AG03	P13	3	TP1,TP2,TP3
Gradation of Aggregate	AG04	P14	3	TP1,TP2,TP3
NAA Test for Fine Aggregate Particle Shape	AG05	P14A (Note 2)	3	TP1,TP2,TP3
C. ASPHALT CEMENT:				
Abson Recovery	AE01	P21	3	TP1,TP2,TP3
Penetration at 77F & 115F	AE02	P22	3	TP1,TP2,TP3
Specific Gravity (60F)	AE03	P23	3	TP1,TP2,TP3
Viscosity at 77F	AE04	P24	3	TP1,TP2,TP3
Viscosity at 140F & 275F	AE05	P25	3	TP1,TP2,TP3

NOTES:
1. Creep compliance will be performed when suitable procedures are developed -- cores will be stored.
2. National Aggregate Association will perform tests at no cost to the State.
3. Cores within brackets are from the same sampling area.

TABLE 3. 48A5 LABORATORY TESTING PLANS (PRE-CONSTRUCTION)
(Continued)

MATERIAL TYPE AND PROPERTIES	SHRP TEST DESIGNATION	SHRP PROTOCOL	NO. OF TESTS PER LAYER	MATERIAL SOURCE/ SAMPLE TYPE DESIGNATION
II. BOUND (TREATED) BASE AND SUBBASE				
Type and Classification of Material and Treatment	TB01	P31	3	[C6,C7],[C15,C16],[C26,C27]
Pozzolanic/Cementitious: Compressive Strength	TB02	P32	3	[C6,C7],[C15,C16],[C26,C27]
Moisture-Density Relations	UG05	P44	3	TP1,TP2,TP3
Resilient Modulus	UG07	P46	3	A1-A3
Natural Moisture Content	UG10	P49	3	TP1,TP2,TP3
III. UNBOUND GRANULAR BASE AND SUBBASE				
Not Applicable				
IV. SUBGRADE (LIME-TREATED & NATURAL) (All tests will be conducted individually for both layers)				
Sieve Analysis	SS01	P51	3	TP1,TP2,TP3
Hydrometer to 0.001mm	SS02	P42	3	TP1,TP2,TP3
Atterberg Limits	SS03	P43	3	TP1,TP2,TP3
Classification	SS04	P52	3	TP1,TP2,TP3
Moisture-Density Relations	SS05	P55	3	TP1,TP2,TP3
Resilient Modulus	SS07	P46	3	A1-A3
Unit Weight	SS08	P56	3	TP1,TP2,TP3
Natural Moisture Content	SS09	P49	3	TP1,TP2,TP3
Depth to Rigid Layer			3	S1,S2,S3

TABLE 3. 48A5 LABORATORY TESTING PLANS (POST-CONSTRUCTION)

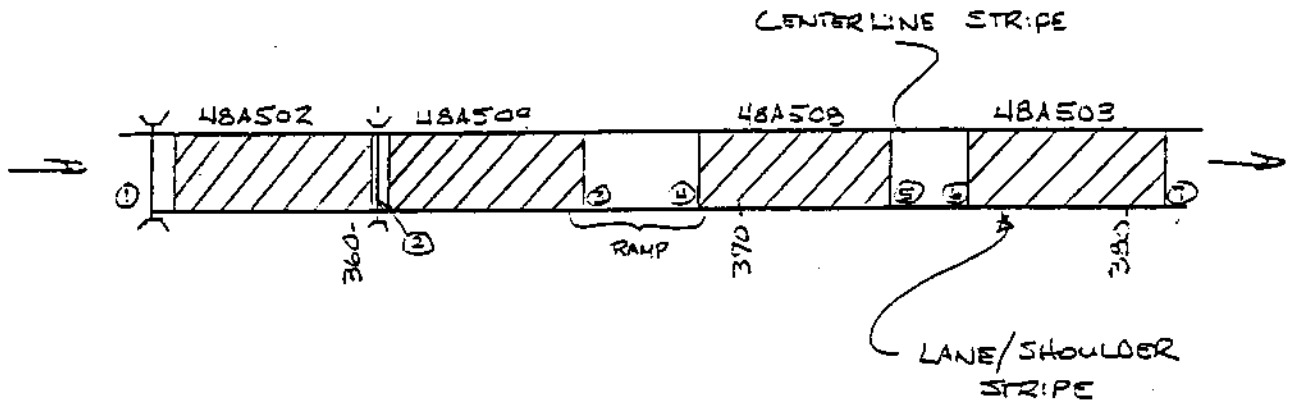
MATERIAL TYPE AND PROPERTIES	SHRP TEST DESIGNATION	SHRP PROTOCOL	NO. OF TESTS PER LAYER	MATERIAL SOURCE/ SAMPLE TYPE DESIGNATION
A. ASPHALTIC CONCRETE:				
Core Examination/Thickness	AC01	P01	36	All Cores
Bulk Specific Gravity	AC02	P02	36	All Cores
Maximum Specific Gravity	AC03	P03	6	BV1,BV2,BV3,BR1,BR2,BR3
Asphalt Content (Extraction)	AC04	P04	6	BV1,BV2,BV3,BR1,BR2,BR3
Moisture Susceptibility	AC05	P05	6	BV1,BV2,BV3,BR1,BR2,BR3
Creep Compliance	AC06	P06	2	[C38,C39,C40],[C56,C57,C58] (Note 1)
Resilient Modulus	AC07	P07	6	[C42,C43],[C45,C46],[C48,C49], [C51,C52],[C54,C55],[C60,C61]
Tensile Strength	AC07	P07	18	[C41,C42,C43],[C44,C45,C46], [C47,C48,C49],[C50,C51,C52], [C53,C54,C55],[C59,C60,C61]
B. EXTRACTED AGGREGATE:				
Bulk Specific Gravity:				
Coarse Aggregate	AG01	P11	6	BV1,BV2,BV3,BR1,BR2,BR3
Find Aggregate	AG02	P12	6	BV1,BV2,BV3,BR1,BR2,BR3
Type and Classification:				
Coarse Aggregate	AG03	P13	6	BV1,BV2,BV3,BR1,BR2,BR3
Find Aggregate	AG03	P13	6	BV1,BV2,BV3,BR1,BR2,BR3
Gradation of Aggregate	AG04	P14	6	BV1,BV2,BV3,BR1,BR2,BR3
NAA Test for Fine Aggregate Particle Shape	AG05	P14A (Note 2)	6	BV1,BV2,BV3,BR1,BR2,BR3
C. ASPHALT CEMENT:				
Abson Recovery	AE01	P21	6	BV1,BV2,BV3,BR1,BR2,BR3
Penetration at 77F & 115F	AE02	P22	6	BV1,BV2,BV3,BR1,BR2,BR3
Specific Gravity (60F)	AE03	P23	6	BV1,BV2,BV3,BR1,BR2,BR3
Viscosity at 77F	AE04	P24	6	BV1,BV2,BV3,BR1,BR2,BR3
Viscosity at 140F & 275F	AE05	P25	6	BV1,BV2,BV3,BR1,BR2,BR3

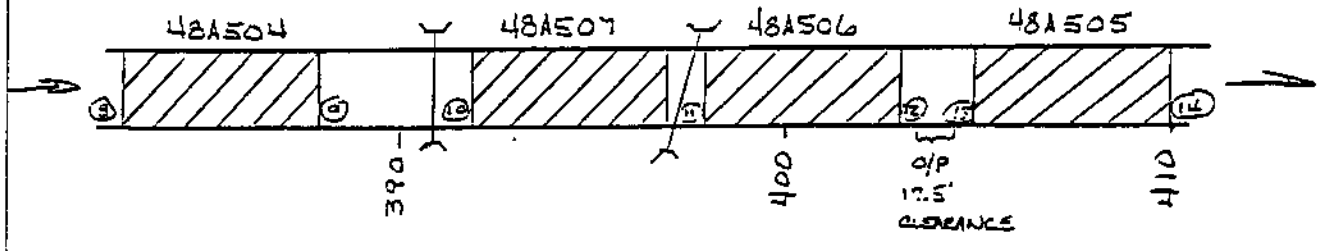
NOTES:
1. Creep compliance will be performed when suitable procedures are developed -- cores will be stored.
2. National Aggregate Association will perform tests at no cost to the State.

SHRP AC REHAB STUDY SITE (48A5)

US 175 (EASTBOUND), KAUFMAN CO.

SECTION LAYOUT





(#) SAMPLING AREA NUMBERS
FOR SAMPLE AREA DETAILS SEE: FIGURE 2 (PRE-CONSTRUCTION)
FIGURE 3 (POST-CONSTRUCTION)

NOTE: GPS SITE 481069 (AT STA'S 316-321) AND SPS SITE 488340 (AT STA'S 331-336) WILL SERVE AS CONTROLS FOR 48A5

FIGURE 1

SAMPLING AREA (SA) DETAILS
(PRE-CONSTRUCTION)

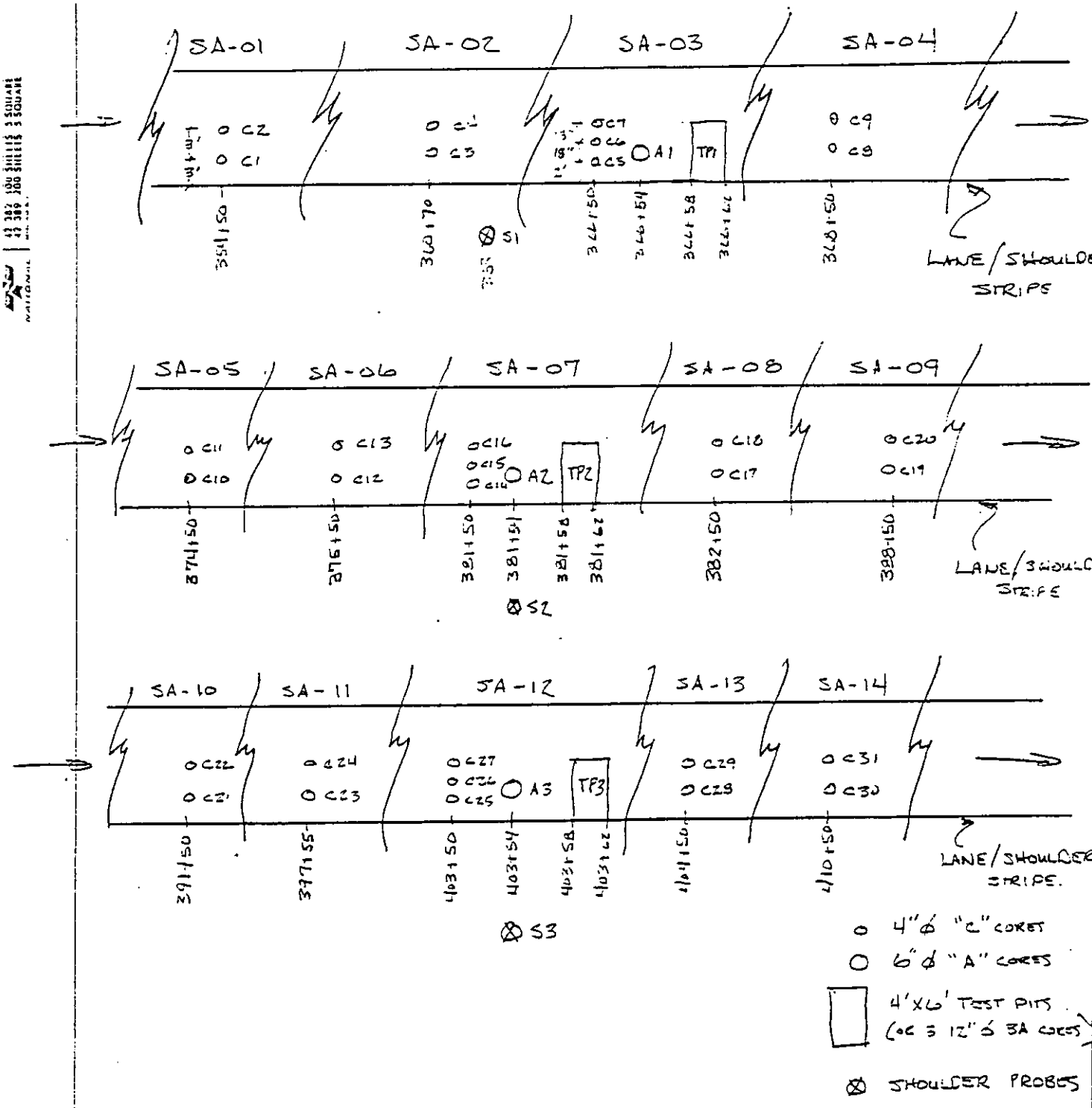


FIGURE 2

Sampling Area (SA) Details
(Post-Construction)

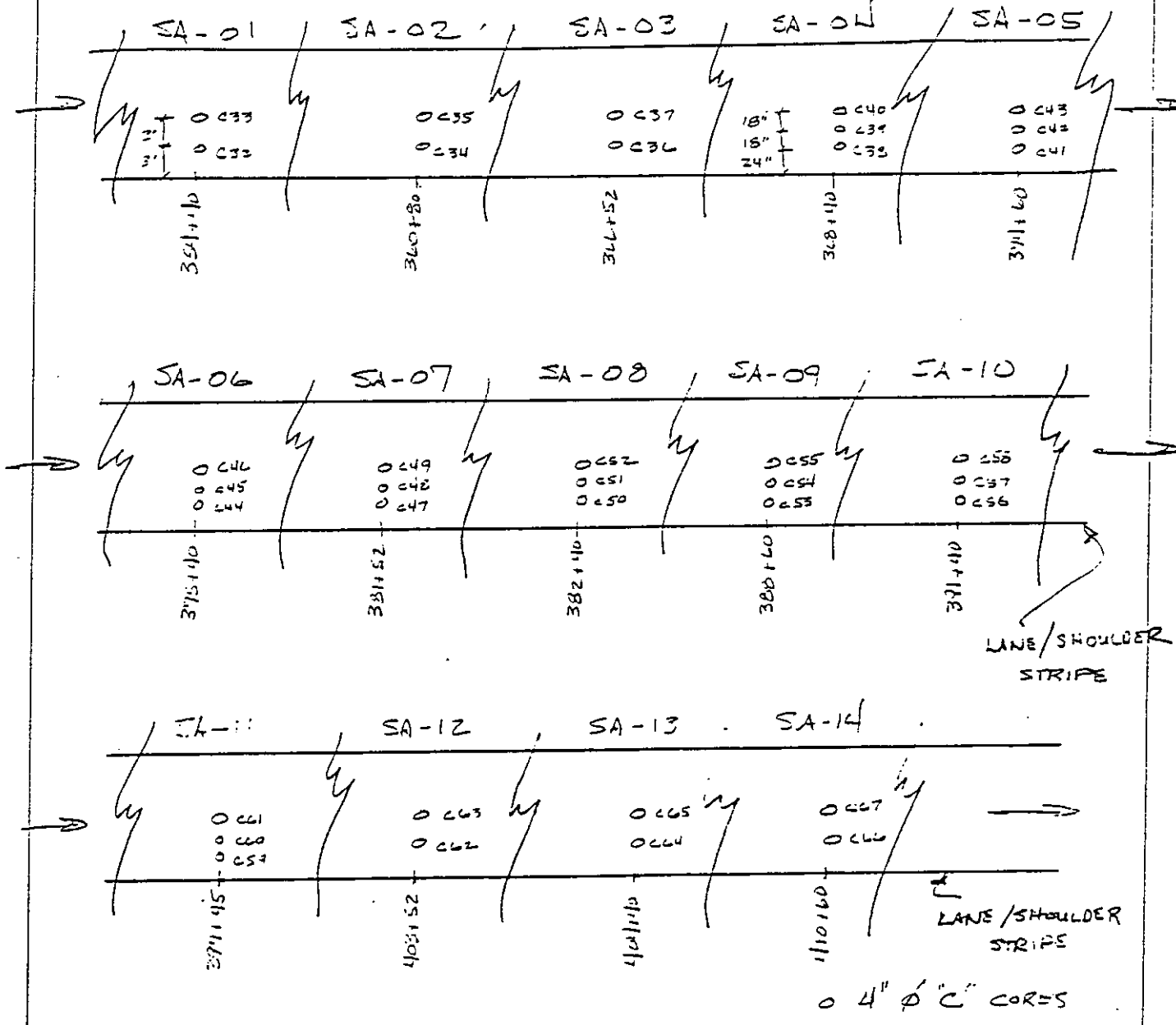


Figure 3

NATIONAL RESEARCH COUNCIL

STRATEGIC HIGHWAY RESEARCH PROGRAM

Southern Region, 8240 MoPac Expressway, Suite 250, Austin, TX 78759 Tel. (512) 346-7477 Fax (512) 346-8750

December 12, 1990

HOMER G. WHEELER
Regional Engineer

Dr. Amir N. Hanna
Strategic Highway Research Program
818 Connecticut Avenue, N.W. - 4th Floor
Washington, DC 20006

Subject: Materials Sampling and Field Testing Plan for SPS Section 48A5 in Kaufman, TX.

Dear Amir,

The attached Materials Sampling and Field Testing Plan for Section 48A5 in Kaufman, Texas, has been prepared and is being submitted for your approval, in accordance with the guidelines set forth in Operational Memorandum (OM) No.14, "Materials Sampling and Testing Requirements for SPS-5 Rehabilitation of Asphalt Concrete Pavements". This plan has been prepared in coordination with James Sassin of the Texas SDHPT, and it is my understanding that Jim Brown has recently discussed the topic with you.

There are two particularly noteworthy features of this plan, which make it unique from the example shown in the OM. A preference of test pits over the three 12″ core holes was noted (see page 14). The State also shares this sentiment, for patching purposes and sample recovery. With this in mind, this plan shows the use of three test pits in lieu of one test pit and six 12″ diameter core holes. The associated modifications to the sampling plan have also been made to reflect this modification (i.e., 12″ × 12″ slab samples as opposed to 12″ cores, etc.).

The other particularly unique feature of this plan is that some of the sections share a common sampling area due to relatively short transition areas (i.e., 50′ to 100′ of transition). This should not be a particular problem, however, as sufficient samples are being recovered to adequately represent this stretch of road.

As this work is to begin early next spring, we are eager to complete this material sampling and field testing. With this in mind, we would greatly appreciate your review and approval of this sampling plan by early January.

Please let us know if you have any questions or comments on any of the above.

Sincerely,

Homer

Homer G. Wheeler, P.E.
SHRP Regional Engineer, SRCO

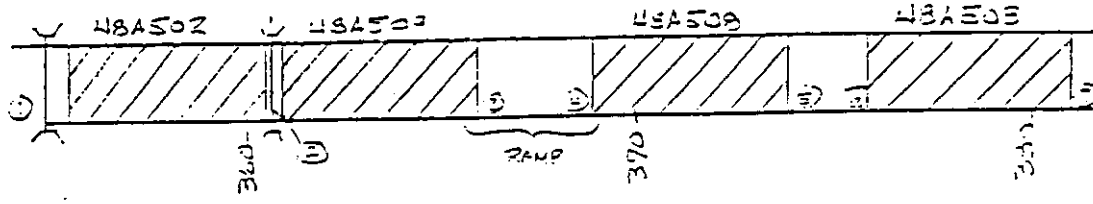
Attachments: As stated above.

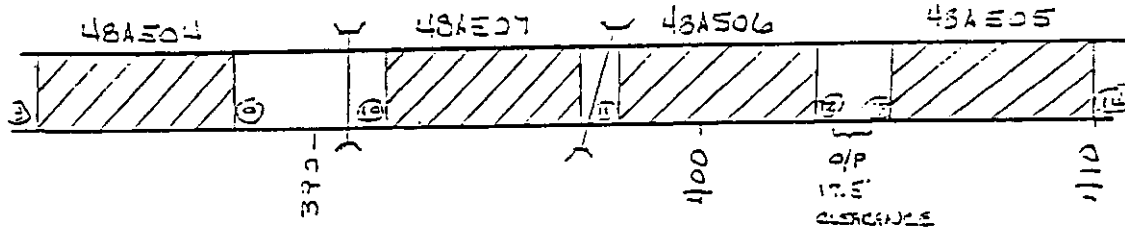
cc.w/Attach: James L. Brown, D8PD-TX SDHPT
Brent Rauhut, PM-SRCO

HGW:dmj

NATIONAL RESEARCH COUNCIL IS THE PRINCIPAL OPERATING AGENCY OF THE NATIONAL ACADEMY OF SCIENCES AND THE NATIONAL ACADEMY OF ENGINEERING TO SERVE GOVERNMENT AND OTHER ORGANIZATIONS

48A5 LAYOUT





(5) SAMPLING AREA NUMBERS
FOR SAMPLE AREA DETAILS SEE: FIGURE 2 (PRE-CONSTRUCTION)
FIGURE 3 (POST-CONSTRUCTION)

NOTE: GPS SITE 48106? (AT STA.'S 316-321) AND CPS SITE 48B340 (AT STA.'S 331-376) WILL SERVE AS CONTROLS FOR 48A5

FIGURE 1

Sampling Area (SA) Details
(Pre-Construction)

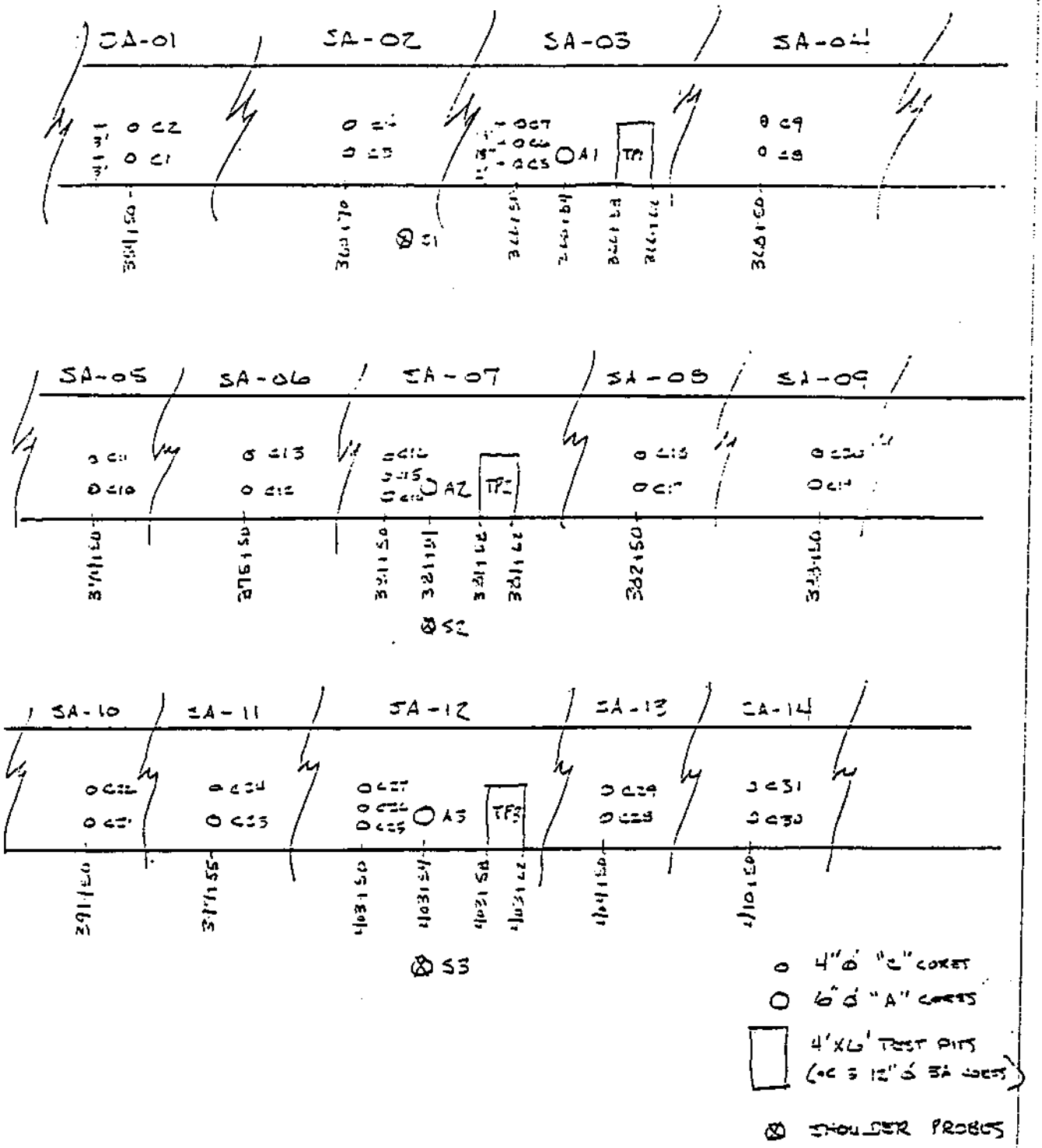


Figure 2

Sampling Area (SA) Detail
(Post-Construction)

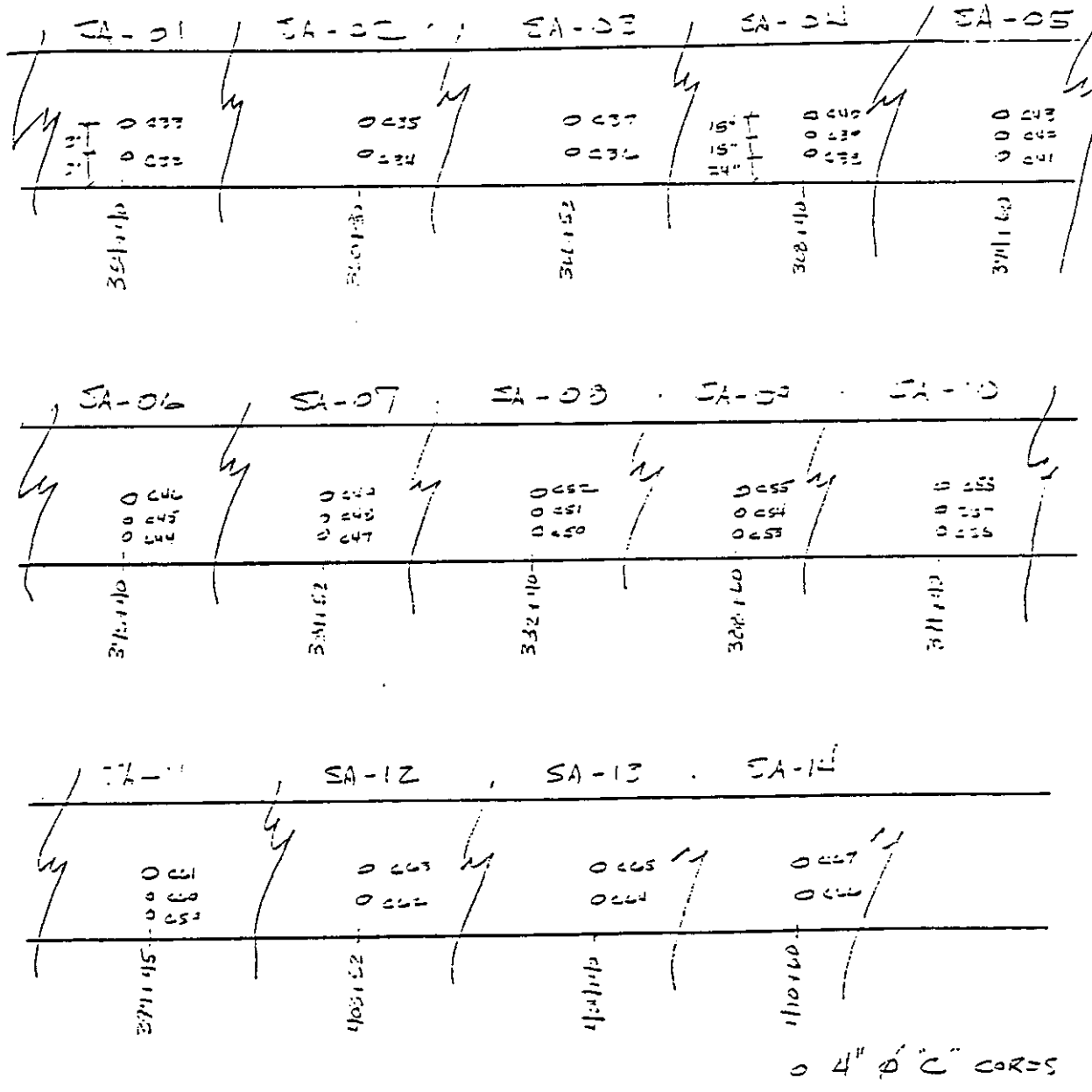


Figure 3

TABLE 1. SCOPE OF MATERIALS SAMPLING AND FIELD TESTING

MATERIAL & SAMPLING DESCRIPTION	NUMBER OF MATERIAL SAMPLES	SAMPLE TYPE DESIGNATION
PRE-CONSTRUCTION SAMPLING		
1. Asphalt Concrete (Original Layer)		
Coring - 4" diam. cores	31	C1-C31
Coring - 6" diam. cores	3	A1-A3
Bulk Sampling (12" × 12" Slab)	6	TP1, TP2, TP3
2. Unbound Base/Subbase Layers (Per Layer)		
Augering 6" diam. holes	3	A1-A3
Bulk Sampling in Test Pit	6	TP1, TP2, TP3
In Situ Density & Moisture Content (Nuclear Gauge)	6	TP1, TP2, TP3
Moisture Content Samples	6	TP1, TP2, TP3
3. Bound Base/Subbase Layers (Per Layer)		
Coring - 4" diam. cores	6	C4, C5, C15, C16, C23,
Coring - 6" diam. cores	3	C24
Bulk Sampling (12" × 12" Slabs)	6	A1-A3
		TP1, TP2, TP3
4. Subgrade		
Splitspoon Sampling	6*	A1-A3
Thin-walled Tube Sampling (* 2 Tubes or 2 Spoons or combination per hole)	6*	A1-A3
Bulk Sampling in Test Pits	6	TP1, TP2, TP3
In Situ Density & Moisture Content (Nuclear Gauge)	6	TP1, TP2, TP3
Moisture Content Samples	6	TP1, TP2, TP3
5. Shoulder Auger Probes	3	S1-S3
POST-CONSTRUCTION SAMPLING		
1. Asphaltic Concrete (Overlay)		
Coring - 4" diam. cores	36	C32-C67

TABLE 2. BULK MATERIAL SAMPLING DURING CONSTRUCTION

A. Materials to be Tested as a Part of LTPP.

MATERIAL & SAMPLING DESCRIPTION	NUMBER OF MATERIAL SAMPLES	SAMPLE LOCATION
1. Virgin Asphalt Concrete Mix	100 lb.	Mix Plant
2. Recycled Asphalt Concrete Mix	100 lb.	Mix Plant

B. Materials to be Shipped to the SHRP Asphalt Reference Library.

MATERIAL & SAMPLING DESCRIPTION	NUMBER OF MATERIAL SAMPLES	SAMPLE LOCATION
1. Asphalt Cement (Virgin Mix)		
5 Gallon Containers	11	Mix Plant
2. Asphalt Cement (Recycled Mix)		
5 Gallon Containers	11	Mix Plant
3. Aggregate		
Used in Virgin Mix (55 gal. drums)	1000 lbs.	Mix Plant
Used in Recycled Mix (55 gal. drums)	1000 lbs.	Mix Plant
4. Recycled Asphaltic Concrete (Prior to Remixing)	1000 lbs.	Mix Plant
5. Finished Asphaltic Concrete Mix		
Virgin AC Mix	200 lbs.	Mix Plant
Recycled AC Mix	200 lbs.	Mix Plant

TABLE 5. 48A5 LABORATORY TESTING PLANS (PRE-CONSTRUCTION)

MATERIAL TYPE AND PROPERTIES	SHRP TEST DESIGNATION	SHRP PROTOCOL	NO. OF TESTS PER LAYER	MATERIAL SOURCE/ SAMPLE TYPE DESIGNATION
PRE-CONSTRUCTION				
I. ASPHALT CONCRETE:				
A. ASPHALTIC CONCRETE:				
* Core Examination/Thickness	AC01	P01	31	All C-Type Cores
* Bulk Specific Gravity	AC02	P02	9	[C5,C6,C7],[C14,C15,C16], [C25,C26,C27] (Note 3)
* Maximum Specific Gravity	AC03	P03	3	TP1,TP2,TP3
* Asphalt Content (Extraction)	AC04	P04	3	TP1,TP2,TP3
Creep Compliance	AC06	P06	3	C3,C13,C29 (Note 1)
Resilient Modulus	AC07	P07	6	[C6,C7],[C15,C16],[C26,C27]
* Tensile Strength	AC07	P07	9	[C5,C6,C7],[C14,C15,C16], [C25,C26,C27]
* Field Moisture Damage	AC08	P08	3	A1,A2,A3
B. EXTRACTED AGGREGATE:				
* Type and Classification:				
Coarse Aggregate	AG03	P13	3	TP1,TP2,TP3
Find Aggregate	AG03	P13	3	TP1,TP2,TP3
* Gradation of Aggregate	AG04	P14	3	TP1,TP2,TP3
NAA Test for Fine Aggregate Particle Shape	AG05	P14A (Note 2)	3	TP1,TP2,TP3
C. ASPHALT CEMENT:				
* Abson Recovery	AE01	P21	3	TP1,TP2,TP3
* Penetration at 77F & 115F	AE02	P22	3	TP1,TP2,TP3
* Specific Gravity (60F)	AE03	P23	3	TP1,TP2,TP3
* Viscosity at 77F	AE04	P24	3	TP1,TP2,TP3
* Viscosity at 140F & 275F	AE05	P25	3	TP1,TP2,TP3

NOTES:
1. Creep compliance will be performed when suitable procedures are developed -- cores will be stored.
2. National Aggregate Association will perform tests at no cost to the State.
3. Cores within brackets are from the same sampling area.

* Done by Texas SDHPT.

TABLE 3. 48A5 LABORATORY TESTING PLANS (PRE-CONSTRUCTION)
(Continued)

MATERIAL TYPE AND PROPERTIES	SHRP TEST DESIGNATION	SHRP PROTOCOL	NO. OF TESTS PER LAYER	MATERIAL SOURCE/ SAMPLE TYPE DESIGNATION
II. BOUND (TREATED) BASE AND SUBBASE				
Type and Classification of Material and Treatment	TB01	P31	3	[C6,C7],[C15,C16],[C26,C27]
Pozzolanic/Cementitious: Compressive Strength	TB02	P32	3	[C6,C7],[C15,C16],[C26,C27]
Asphalt Treated: Dynamic Modulus (77F)	TB03	P33	3	[C6,C7],[C15,C16],[C26,C27]
HMAC: Resilient Modulus	AC07	P07	3	[C6,C7],[C15,C16],[C26,C27]
III. UNBOUND GRANULAR BASE AND SUBBASE				
* Particle Size Analysis	UG01	P41	3	TP1,TP2,TP3
* Sieve Analysis (Washed)	UG02	P41	3	TP1,TP2,TP3
* Atterberg Limits	UG04	P43	3	TP1,TP2,TP3
* Moisture-Density Relations	UG05	P44	3	TP1,TP2,TP3
Resilient Modulus	UG07	P46	3	TP1,TP2,TP3
* Classification	UG08	P47	3	TP1,TP2,TP3
* Permeability	UG09	P48	3	TP1,TP2,TP3
* Natural Moisture Content	UG10	P49	3	TP1,TP2,TP3
IV. SUBGRADE				
* Sieve Analysis	SS01	P51	3	TP1,TP2,TP3
Hydrometer to 0.001mm	SS02	P42	3	TP1,TP2,TP3
* Atterberg Limits	SS03	P43	3	TP1,TP2,TP3
* Classification	SS04	P52	3	TP1,TP2,TP3
* Moisture-Density Relations	SS05	P55	3	TP1,TP2,TP3
Resilient Modulus	SS07	P46	3	TP1,TP2,TP3
* Unit Weight	SS08	P56	3	TP1,TP2,TP3
* Natural Moisture Content	SS09	P49	3	TP1,TP2,TP3
Depth to Rigid Layer			3	S1,S2,S3

* Done by Texas SDHPT.

TABLE 3. 48A5 LABORATORY TESTING PLANS (POST-CONSTRUCTION)

MATERIAL TYPE AND PROPERTIES	SHRP TEST DESIGNATION	SHRP PROTOCOL	NO. OF TESTS PER LAYER	MATERIAL SOURCE/ SAMPLE TYPE DESIGNATION
A. ASPHALTIC CONCRETE:				
* Core Examination/Thickness	AC01	P01	36	All Cores
* Bulk Specific Gravity	AC02	P02	36	All Cores
* Maximum Specific Gravity	AC03	P03	6	BV1,BV2,BV3,BR1,BR2,BR3
* Asphalt Content (Extraction)	AC04	P04	6	BV1,BV2,BV3,BR1,BR2,BR3
* Moisture Susceptibility	AC05	P05	6	BV1,BV2,BV3,BR1,BR2,BR3
Creep Compliance	AC06	P06	2	[C38,C39,C40],[C56,C57,C58] (Note 1)
Resilient Modulus	AC07	P07	6	[C42,C43],[C45,C46],[C48,C49], [C51,C52],[C54,C55],[C60,C61]
* Tensile Strength	AC07	P07	18	[C41,C42,C43],[C44,C45,C46], [C47,C48,C49],[C50,C51,C52], [C53,C54,C55],[C59,C60,C61]
B. EXTRACTED AGGREGATE:				
* Bulk Specific Gravity:				
Coarse Aggregate	AG01	P11	6	BV1,BV2,BV3,BR1,BR2,BR3
Find Aggregate	AG02	P12	6	BV1,BV2,BV3,BR1,BR2,BR3
* Type and Classification:				
Coarse Aggregate	AG03	P13	6	BV1,BV2,BV3,BR1,BR2,BR3
Find Aggregate	AG03	P13	6	BV1,BV2,BV3,BR1,BR2,BR3
* Gradation of Aggregate	AG04	P14	6	BV1,BV2,BV3,BR1,BR2,BR3
NAA Test for Fine Aggregate Particle Shape	AG05	P14A (Note 2)	6	BV1,BV2,BV3,BR1,BR2,BR3
C. ASPHALT CEMENT:				
* Abson Recovery	AE01	P21	6	BV1,BV2,BV3,BR1,BR2,BR3
* Penetration at 77F & 115F	AE02	P22	6	BV1,BV2,BV3,BR1,BR2,BR3
* Specific Gravity (60F)	AE03	P23	6	BV1,BV2,BV3,BR1,BR2,BR3
* Viscosity at 77F	AE04	P24	6	BV1,BV2,BV3,BR1,BR2,BR3
* Viscosity at 140F & 275F	AE05	P25	6	BV1,BV2,BV3,BR1,BR2,BR3

NOTES:
1. Creep compliance will be performed when suitable procedures are developed -- cores will be stored.
2. National Aggregate Association will perform tests at no cost to the State.

* Done by Texas SDHPT.

APPENDIX E

CONSTRUCTION DATA

Page Nº.

APPLICABLE CONSTRUCTION DATA SHEETS FOR SECTIONS:

48A501 ..... E.2
48A502 ..... E.3
48A503 ..... E.18
48A504 ..... E.25
48A505 ..... E.32
48A506 ..... E.50
48A507 ..... E.58
48A508 ..... E.67
48A509 ..... E.76

REHABILITATION DATA SHEETS

RECYCLED ASPHALT PAVEMENT SURFACE COURSE USED ON:
- 48A502, 48A509, 48A508, AND 48A503 ..... E.84
- ORIGINAL MIX DESIGN E.95

RECYCLED ASPHALT PAVEMENT BINDER COURSE USED ON:
- 48A508 AND 48503 ..... E.101
- ORIGINAL MIX DESIGN E.112

VIRGIN ASPHALT SURFACE COURSE USED ON:
- 48A504, 48A507, 48A506, AND 48A505 ..... E.118
- ORIGINAL MIX DESIGN E.125

VIRGIN ASPHALT BINDER COURSE USED ON:
- 48A504 AND 48A507 ..... E.132
- ORIGINAL MIX DESIGN E.139

SHOULDER RESTORATION E.146

LTPP-SPS CONSTRUCTION DATA MISCELLANIOUS CONSTRUCTION NOTES AND COMMENTS CONSTRUCTION DATA SHEET 11	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 1]

Provide any miscellanious comments and notes concering construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indicatation of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

THE CONTROL SECTION (48A501) IS ALSO THE CONTROL. FOR THE SPS-3 PROJECT AT THIS LOCATION (48B340).

NO "SURFACE PREPARATION" (CONSTRUCTION DATA SHEETS 3 & 4 WAS APPLIED TO THIS SECTION)

NO NUCLEAR DENSITY MEASUREMENTS OR PROFILOGRAPH MEASUREMENTS WERE CONDUCTED ON THIS SITE (CONSTRUCTION DATA SHEET 9)

AND NO SHOULDER RESTORATION WORK WAS PERFORMED (REHABILITATION DATA SHEET 61)

PREPARER Jerome F. Dahl EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA REVISED LAYER DESCRIPTIONS CONSTRUCTION DATA SHEET 2	* STATE CODE [4 0] * SPS PROJECT CODE [A S] * TEST SECTION NO. [0 2]

1. LAYER NUMBER	2. LAYER DESCRIPTION	3. MATERIAL TYPE CLASS	4. LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 1]	[redacted]	[redacted]	[redacted]	[redacted]
2	[0 6]	[3 6]	[10.0]	---.-	---.-	---.-
3	[0 5]	[2 3]	[11.0]	---.-	---.-	---.-
4	[0 4]	[2 8]	[8.0]	---.-	---.-	---.-
5	[0 3]	[0 1]	[1.5]	---.-	---.-	---.-
6	[0 1]	[1 3]	[2.3]	1.7	2.9	0.3
7	[ ]	[ ]	[---.-]	---.-	---.-	---.-
8	[ ]	[ ]	[---.-]	---.-	---.-	---.-
9	[ ]	[ ]	[---.-]	---.-	---.-	---.-
10	[ ]	[ ]	[---.-]	---.-	---.-	---.-
11	[ ]	[ ]	[---.-]	---.-	---.-	---.-
12	[ ]	[ ]	[---.-]	---.-	---.-	---.-
13	[ ]	[ ]	[---.-]	---.-	---.-	---.-
14	[ ]	[ ]	[---.-]	---.-	---.-	---.-
15	[ ]	[ ]	[---.-]	---.-	---.-	---.-

NOTES:

1. Layer 1 is subgrade soil, the highest numbered layer is the pavement surface.
2. Layer description codes:

Overlay.....01	Base Layer.....05	Porous Friction Course..09
Seal/Tack Coat.....02	Subbase Layer.....06	Surface Treatment.....10
Original Surface.....03	Subgrade.....07	Embankment (Fill).....11
HMAC Layer (Subsurface).04	Interlayer.....08	

If milling was performed, the layers which were milled shall be assigned their previous layer number and material type. If the layer was completely removed by milling, it shall still be shown as a layer with a zero thickness.

3. Enter the material type classification codes from Tables A.5, A.6, A.7 and A.8 which best describes the material in each layer. If the layer was milled, enter the material classification code corresponding to the type material which was removed.
4. Enter the average thickness of each layer and the maximum, minimum, and standard deviation of the thickness measurements, if known. If a layer was partially milled, the remaining thickness of the layer shall be indicated.

PREPARER [signature] EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA OVERLAY PLACEMENT OPERATIONS CONSTRUCTION DATA SHEET 7	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 2]

1. DATE SURFACE PREPARATION BEGAN (Month-Day-Year) [0 9 - 2 6 - 9 1]
2. DATE SURFACE PREPARATION COMPLETED [0 9 - 2 6 - 9 1]

3. SURFACE PREPARATION PRIOR TO PLACEMENT OF OVERLAY [3]
   None..... 1 Broomed..... 2 Broomed + Asphaltic Tack Coat.... 3
   Asphaltic Tack Coat (only).... 4

4. TACK COAT
   Layer Numbers [_ _] [1 0]
   Material Type None..... 1 SS-1.... 2 SS-1H.... 3 CRS-1.... 4 [_ _]
   CRS-2.... 5 CMS-2.... 6 CMS-2H.. 7 CSS-1.... 8 CSS-1H... 9
   Other.... 10 (Specify) RC-250
5. TACK COAT DILUTION
   (Percent) [_ _]
   Mixing Rate Parts Diluent ___ TO Parts Asphalt ___
6. TACK COAT APPLICATION RATE (Gal/Sq. Yd.) [0 . 0 2]

7. ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers
Plant 1	[2]	AZTEC, SUPER SIX PACK	[_ 1 9]	[2 5]	[6] [_] [_]
Plant 2	[_]	_____	[_ _ _]	[_ _]	[_] [_] [_]
Plant 3	[_]	_____	[_ _ _]	[_ _]	[_] [_] [_]

   Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify_____

8. MANUFACTURER OF ASPHALT CONCRETE PAVER BARBER GREENE
9. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER BG-260
10. SINGLE PASS LAYDOWN WIDTH (Feet) [1 2.5]
11. AC BINDER COURSE LIFT
    Layer Number [_ _]
    Nominal First Lift Placement Thickness (Inches) [_._]
    Nominal Second Lift Placement Thickness (Inches) [_._]
12. AC SURFACE COURSE LIFT
    Layer Number [_ 6]
    Nominal First Lift Placement Thickness (Inches) [2.3]
    Nominal Second Lift Placement Thickness (Inches) [_._]
13. SURFACE FRICTION COURSE
    Layer Number [_ _]
    Nominal Placement Thickness (Inches) [_ _]
14. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
    Binder Course [_ + _ _]
    Surface Course [_ + _ _]
    Surface Friction Course [_ + _ _]
15. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2 (specify offset from O/S feet) [_ _._]

16. SIGNIFICANT EVENTS DURING CONSTRUCTION(disruptions, rain, equip. problems, etc.)
    NONE

PREPARER Jerome R. Dill EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 8	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 2]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [09-26-91]
2. DATE PAVING OPERATIONS COMPLETED [09-26-91]

3. LAYER NUMBER [6]

4. MIXING TEMPERATURE (°F) [_ _ _]

5. LAYDOWN TEMPERATURES (°F)
   Mean..... 280. Number of Tests ..... _ _.
   Minimum..... _ _ _. Maximum..... _ _ _.
   Standard Deviation... _ _.

ROLLER DATA (SEE ATTACHED FOR ADDITIONAL DATA ON ROLLERS)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	10.1				
7	B	Steel-Whl Tandem	_ _..				
8	C	Steel-Whl Tandem	_ _..				
9	D	Steel-Whl Tandem	_ _..				
10	E	Pneumatic-Tired	12.4	_ _ _ _.			
11	F	Pneumatic-Tired	_ _..	_ _ _ _.			
12	G	Pneumatic-Tired	_ _..	_ _ _ _.			
13	H	Pneumatic-Tired	_ _..				
14	I	Single-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
15	J	Single-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
16	K	Single-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
17	L	Single-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
18	M	Double-Drum Vibr.	10.1		_ _ _ _.	_ _ _	_ _..
19	N	Double-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
20	O	Double-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
21	P	Double-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	_	_	_
24	Coverages	_ 3.	_ _.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	_	_	_
26	Coverages	_ 6	_ _.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	_	_	_
28	Coverages	_ 2.	_ _.	_ _.	_ _.
29	Air Temperature (°F)	_ 80.	_ _ _.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	2.3	_..	_..	_..
31	Curing Period (Days)	_ 0.1	_ _..	_ _..	_ _..

PREPARER [signature] EMPLOYER BRI DATE _____

DA-48 vibratory compactor

A versatile roller sized for a wide range of paving jobs

INGERSOLL-RAND
CONSTRUCTION EQUIPMENT

The DA-48 compactor: finest quality and reliability, for medium to high-production paving jobs.

Now there's a high-performance vibratory compactor with the reliability you need, in the size you need for most highways and other large paving jobs. The DA-48 has two 66-inch (1680-mm) wide drums—each generating up to 26,020 lb. (115,740 N) of centrifugal force. You can compact up to 250 tons (227 metric tons) of asphalt per hour.

Ingersoll-Rand has designed and manufactured the DA-48 to give you the best productivity and operating economy available in its range. Your operators will like its features, too.

Variable amplitude and frequency

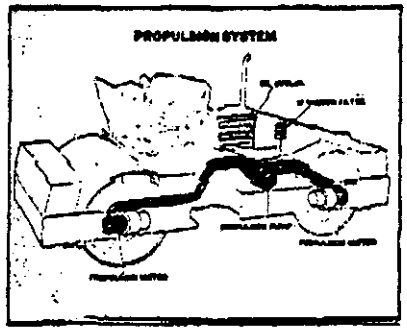
The DA-48 provides variable amplitude with eight settings on each drum. The vibration frequency can be set at either 1850 or 2500 vpm for different materials. An optional 1500 to 2500 vpm frequency is available.

Automatic vibration control

Vibration begins instantly and automatically when travel speed reaches 0.5 mph (0.8 km/hr) and will continue until travel drops below this speed. This prevents marking of the mat by accidental vibration while stopped. A manual override system is provided. The direction of eccentric rotation automatically coincides with travel direction, or can be manually selected. Vibration can be selected for either drum individually, or for both drums simultaneously.

Hydrostatic propulsion system

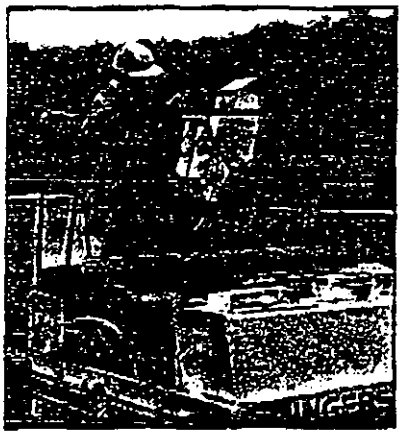
A 42-gallon (160-liter) reservoir supplies oil through a 10-micron filter for the hydraulic system. Hydrostatic propulsion provides infinite control of travel regardless of engine speed, plus dynamic braking. Speeds up to 5.2 mph (8.4 km/hr) in either direction provide ample speed selection for both compaction and travel.



Easy on the operator

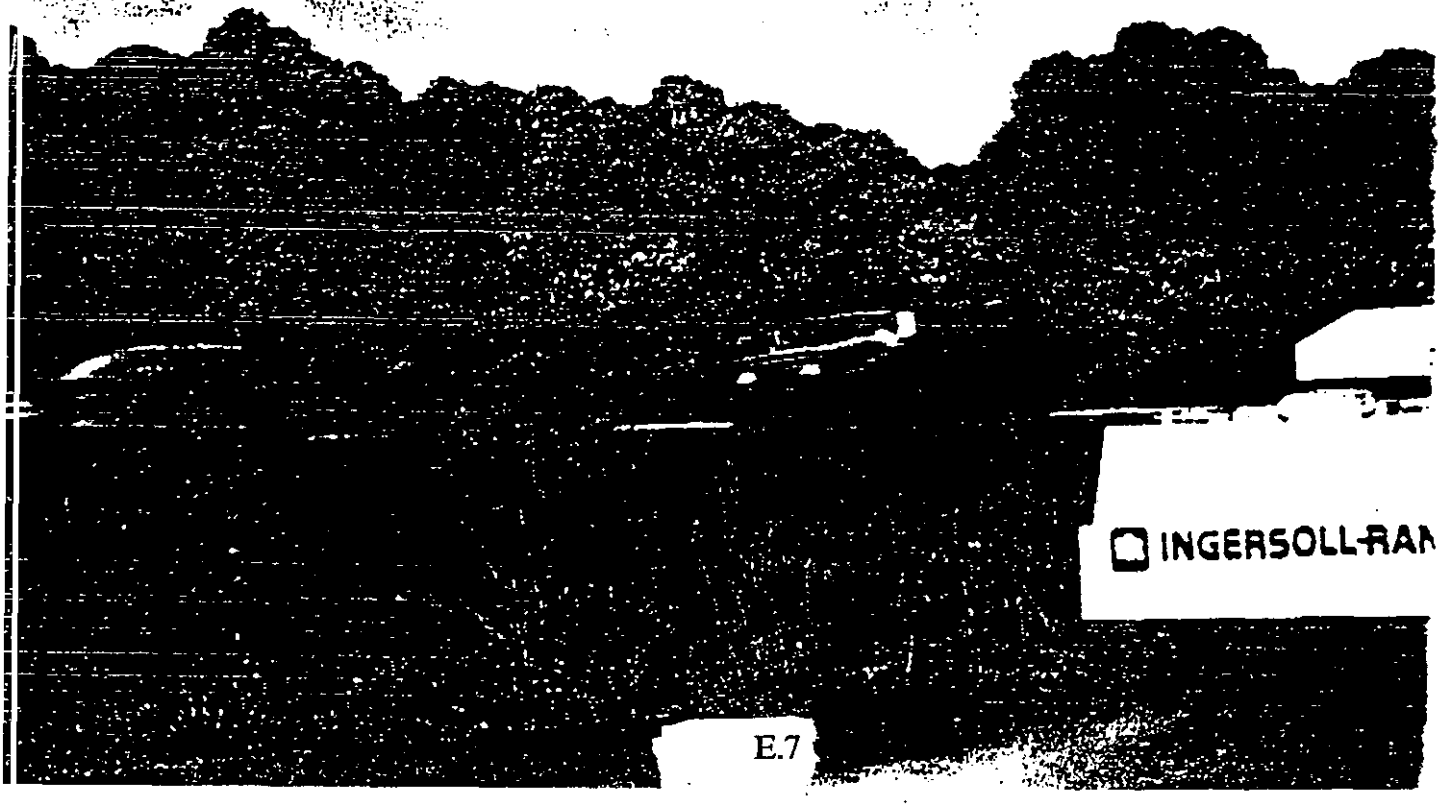
Your operator can rotate his seat and control console through a 180° arc and lock into any of five positions, for best visibility in all directions with comfort.

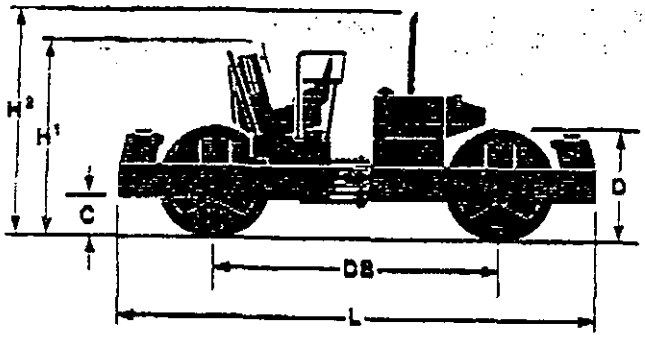
The deck is vibration-isolated, non-skid, and equipped with railings and kick plates. Two easy non-skid steps to mount it. Sound level is within industry standards.

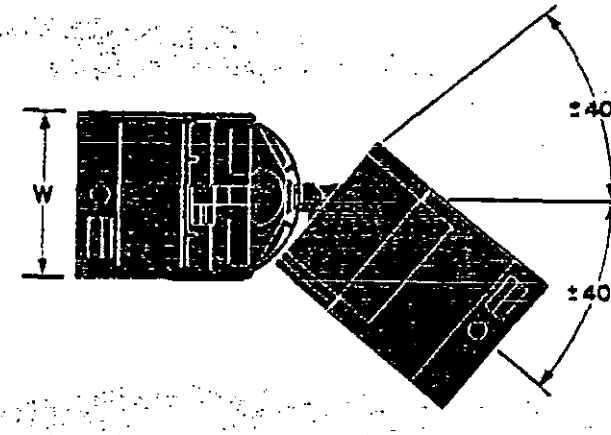


Vibration isolation

Vibration is effectively isolated from the drum frames and operator by rubber shocks at the drum mounts. The operator's deck, hydraulic tank, engine, instrument panel, muffler and air cleaner are also shock-mounted.







DA-48 compactor specifications

Weights:	
Operating weight	20,060 lb. (9100 kg)
Static weight at front drum	9860 lb (4470 kg)
Static weight at rear drum	10,200 lb. (4630 kg)
Shipping weight	18,790 lb. (8520 kg)
Dimensions:	
Overall length (L)	17 ft. 6 in. (5330 mm)
Overall width (W)	5 ft. 10.5 in. (1790 mm)
Overall height	
Top of steering wheel (H^1)	7 ft. 3 in. (2210 mm)
Top of exhaust stack (H^2)	8 ft. 2 in. (2490 mm)
Drum base (DB)	10 ft. 6 in. (3200 mm)
Curb clearance (C)	17 in. (432 mm)
Outside turning radius[1]	17 ft. (5180 mm)
Drum diameter (D)	48 in. (1220 mm)
Drum width	66 in. (1680 mm)
Drum shell thickness (machined)	0.60 in. (15 mm)
Vibration:	
Frequency	1850 or 2500 vpm (31 or 42 Hz)
Optional	1500 to 2500 vpm (25 to 42 Hz)
Centrifugal force per drum	
at minimum amplitude	5850 lb. (26,020 N)
at maximum amplitude	26,020 lb. (115,740 N)
Nominal amplitude (8 positions)	
Minimum amplitude	0.016 in. (0.41 mm)
Maximum amplitude	0.040 in. (1.02 mm)

Engine:	
Engine make and model	Detroit Diesel 3-53T
Rated power @ 2270 rpm	122 hp (91 kw)
Or	Caterpillar 3204-T
	115 hp (86 kw)
Electrical system	12-volt
Propulsion:	
Type	Hydrostatic, parallel circuits to both drums
Drum Drive	Double-reduction planetary gear (right-angle-drive torque hub)
Speed forward and reverse	0 to 5.2 mph (0 to 8.4 km/hr)
Brake system:	
Service brake	Dynamic hydrostatic thru propulsion system
Parking brake	Spring-applied, hydraulically released brake on drum drive input on both drums
Miscellaneous:	
Articulation angle	±40°
Oscillation angle	±10°
Fuel capacity	45 gal. (170 liters)
Hydraulic oil capacity	42 gal. (160 liters)
Water tank capacity	220 gal. (830 liters)
Field gradeability	31%

[1]Turning radius measured to drum edge.

Nothing contained in this brochure is intended to extend any warranty or representation, expressed or implied, regarding the products described herein. Any such warranties or other terms and conditions of sale of products shall be in accordance with Ingersoll-Rand's standard terms and conditions of sale for such products, which are available upon request.

Quality manufacturing

Ingersoll-Rand doesn't just assemble the DA-48; parts are designed, engineered, formed, fabricated and tested in our own plant under continuous quality control. Drums are lathe-turned to insure a smooth finish on asphalt and beveled to prevent marking. The unit has been fully tested at our facilities and again on jobs like yours, to assure the reliability that you expect from Ingersoll-Rand.

Available options

The DA-48 can be furnished with ROPS, EROPS, backup alarm, and lights. Speedometer and vibration frequency meter are also available.

One year/1000-hour warranty

The DA-48 is engineered for reliability, designed for performance, and built to last. It's backed by a warranty for 12 months or 1000 hours of operation.

Ingersoll-Rand Co.
Ingersoll Drive
Shippensburg, Pa. 17257, USA

INGERSOLL-RAND
CONSTRUCTION EQUIPMENT

Form 15084 © 1983 by Ingersoll-Rand Co. Printed in USA

RAD

ORIGINAL

SOLD TO

DRIVER ON ☐ OFF ☐

10251

DATE	CUST. NO.	P.O. NO.	TRUCK NO.	TICKET NO.
9/14/91				

MAT. NO.	DESCRIPTION	CONTRACT NO.	PIT / PLANT
	VIBRATORY ROLLER		

UNIT PRICE	TIME 13:18
NET PRICE	LOAD NO.
TAX TOTAL	GROSS WT 10.12 tonsk
GRAND TOTAL	TARE WT 10.12 tonsk
	NET WT
	JOB TOTAL

WEIGHMASTER

DRIVER

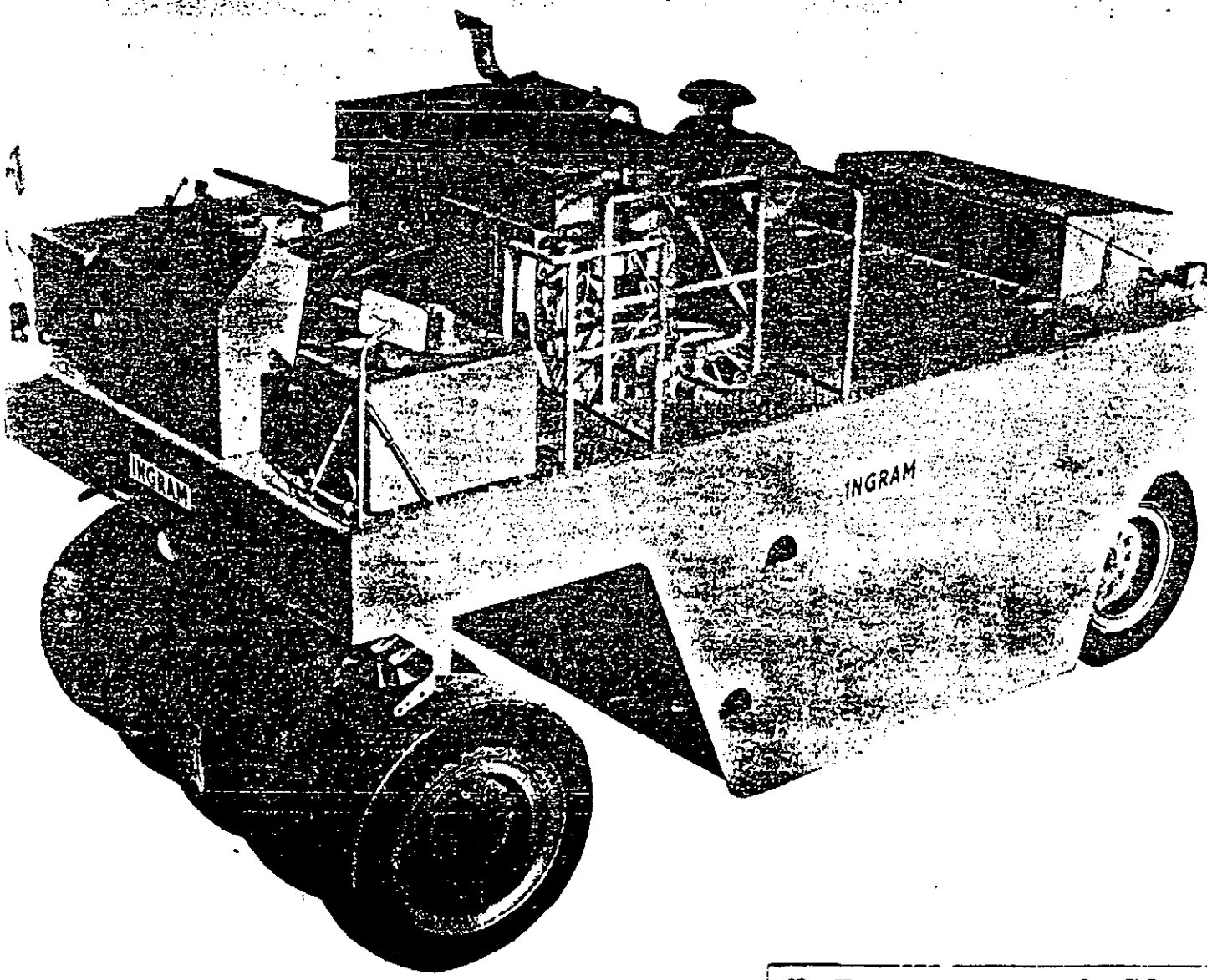
RAP

INGRAM ROLLERS **9-6000-SA** **27 TON**

12-4 TON INTERMODIATE

PNEUMATIC ROLLERS

FO CO 347 383



R. B. EVERETT & CO.
3118 Harrisburg Boulevard
P. O. Box 327
Phone: (713) 224-8161
HOUSTON, TEXAS 77001

INGRAM ROLLERS

INGRAM

POWER

Detroit Diesel 4-53 N 117 BHP @ 2400 RPM, 4 cylinder diesel, 12 volt electrical system, alternator, muffler and Donaldson Cyclopac 2 stage air cleaner with filter condition indicator and dust ejector.

DIMENSIONS

Body Width	96 in.	2438 mm
Over-All Rolling Width	96 in.	2438 mm
Length	194 in.	4927 mm
Height	109 in.	2768 mm
Wheelbase	150 in.	3810 mm
Tire Overlap	15/16 in.	24 mm
Turning Radius (Inside)	15 ft.	4572 mm
Ground Clearance	10 in.	254 mm
Fuel Capacity	50 gal.	189 Liters
Speed	12 m/hr.	19 km/hr.

WEIGHTS

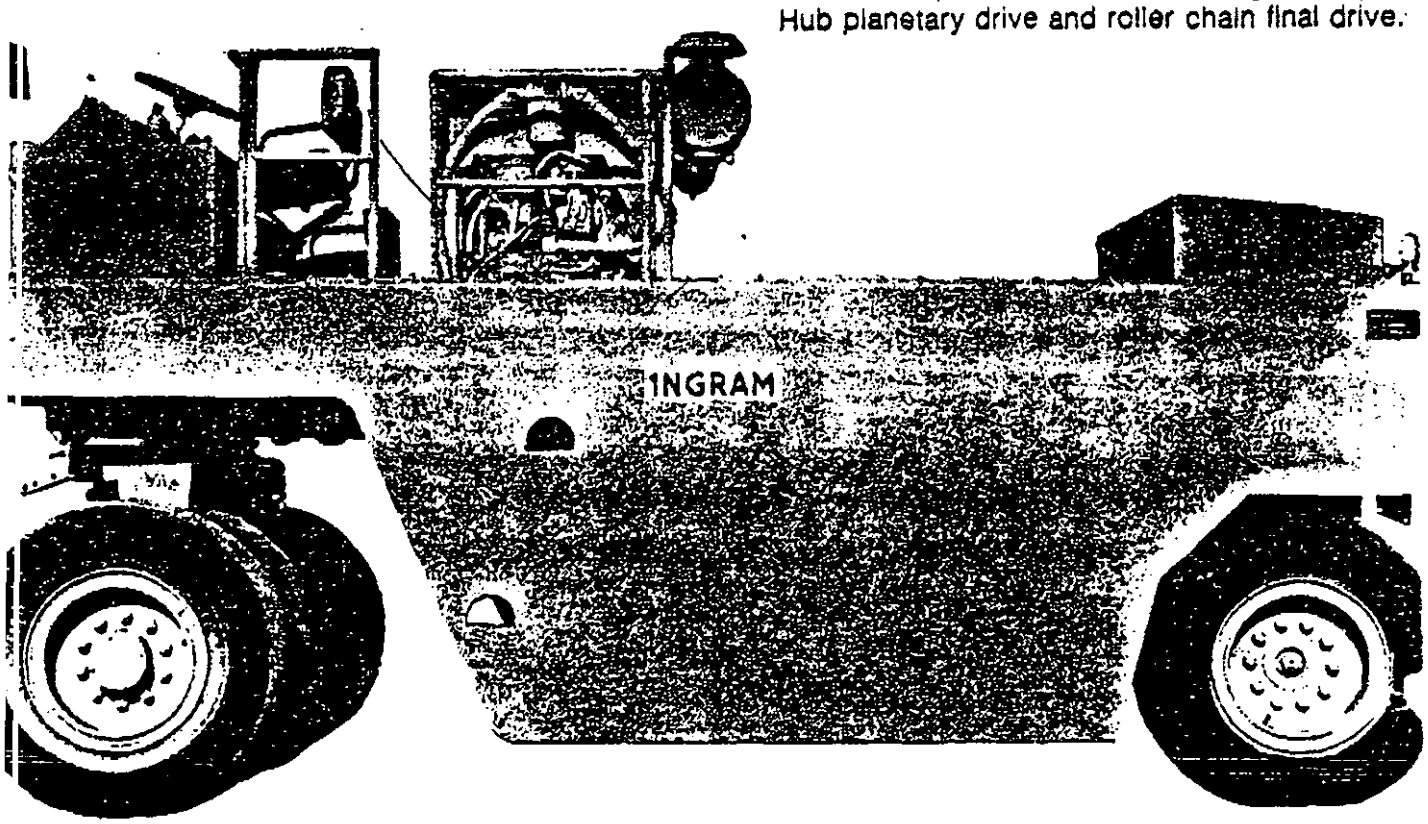
Body Capacity	280 cu. ft.	7.9 cu. m.
Empty Weight	20,400 lbs.	9,253 kgs
Gross Weight		
w/Water (Baffles Req'd)	37,700 lbs	17,100 kgs
w/Sand (Dry)	44,800 lbs	20,321 kgs
w/Sand (Wet)	54,000 lbs	24,494 kgs

TIRES (9 Wheel)

5 Front, 4 Rear		
Smooth Compactor Tires	11.00x20	18 ply

HYDROSTATIC DRIVE

A single lever controls the direction, speed and braking of this roller. The hydrostatic drive system consists of a Sundstrand 24 series variable displacement pump with pressure override, two Sundstrand 23 series variable displacement motors with pressure compensator control, 10 micron suction filter and a heat exchanger. Each motor drives a pair of rear wheels through a Torque-Hub planetary drive and roller chain final drive.



MODEL 9-6000-SA

27 TON

COMPACTION SPECIFICATIONS

11:00x20 SMOOTH COMPACTOR TIRES 18 PLY

BALLAST TYPE	LOAD PER TIRE	GROUND CONTACT	TIRE INFLATION PRESSURE					
			lbs/in² kgs/cm²	50 3.51	70 4.91	90 6.33	105 7.38	120 8.44
EMPTY	2267 lbs 1028 kgs	CONTACT PRESSURE	lbs/in² kgs/cm²	47 3.30	57 4.01	69 4.85	71 4.99	74 5.20
		CONTACT AREA	in² cm²	48.23 31.31	39.77 25.66	33.66 21.73	31.93 20.61	30.63 19.76
WATER	4128 lbs 1900 kgs	CONTACT PRESSURE	lbs/in² kgs/cm²	62 3.86	94 4.60	76 5.34	84 5.91	91 6.40
		CONTACT AREA	in² cm²	80.66 519.13	69.45 422.22	55.12 355.60	49.07 321.49	46.03 296.87
DRY SAND	4875 lbs 2258 kgs	CONTACT PRESSURE	lbs/in² kgs/cm²	55 3.87	67 4.71	79 5.55	88 6.19	93 6.54
		CONTACT AREA	in² cm²	90.61 583.48	74.38 479.41	63.01 406.35	57.88 373.22	53.93 347.86
WET SAND	6000 lbs 2722 kgs	CONTACT PRESSURE	lbs/in² kgs/cm²	58 4.08	70 4.92	83 5.83	88 6.19	95 6.68
		CONTACT AREA	in² cm²	103.45 667.16	88.71 572.25	73.17 472.27	68.18 439.74	63.19 407.46

BRAKES

Normal braking is through the hydrostatic drive, bringing the forward — reverse lever to center position stops all fluid flow and stops the roller. Park and fail-safe brakes are mounted between the variable displacement motors and torque-hubs. They are spring applied and pressure released, therefore any cause for loss of charge pump pressure applies the fail-safe brakes. A control valve is provided at the operators position to activate the fail-safe brakes at any time.

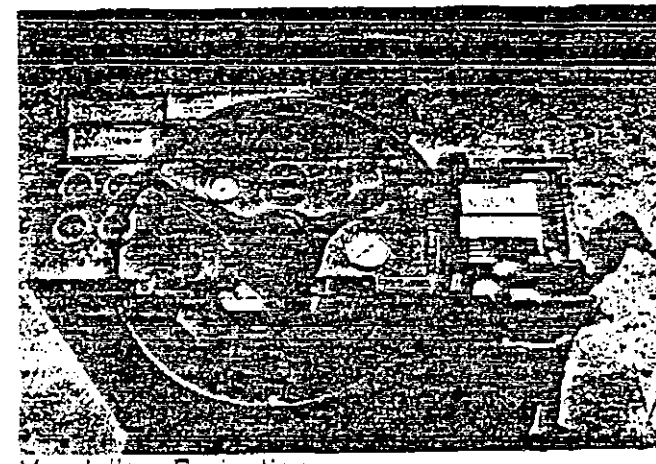
Emergency brakes are air over hydraulic. The brakes are mounted on each drive wheel. The air system has an air pressure gauge and a low air pressure warning buzzer.

STEERING

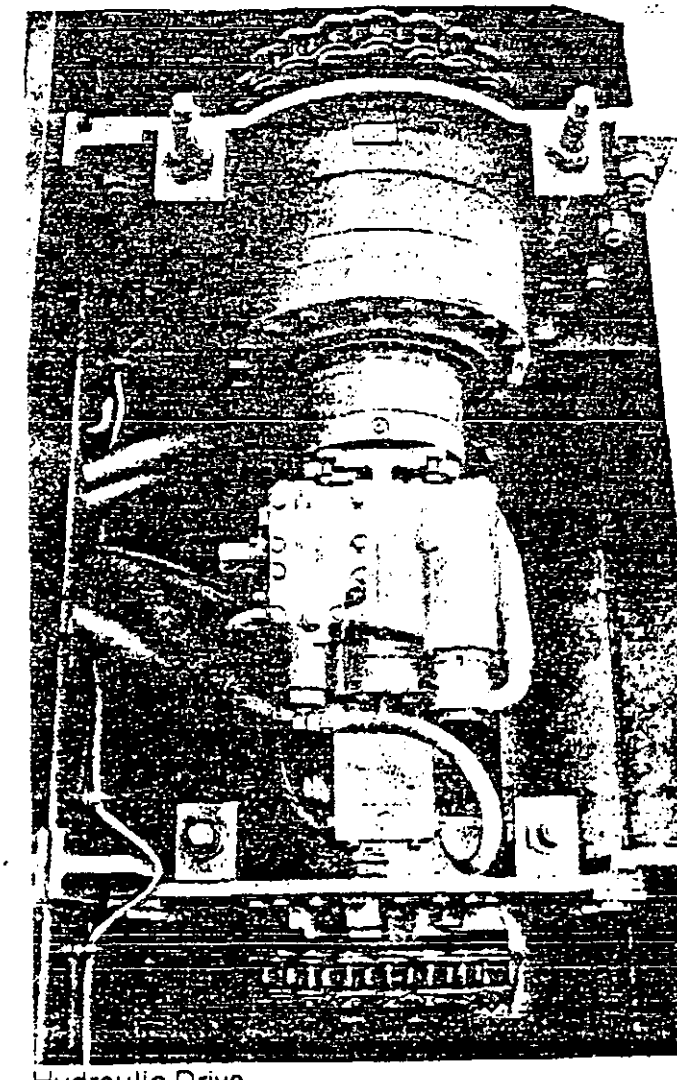
Full power steering is provided through a steering control unit which provides remote rotary servo control with sensory direction and delivery measurement within the same unit. The steering cylinder is 3½ in. (88.9mm) diameter.

VANDALISM PROTECTION

The engine housing, instrument panel and tanks are provided with means for locking.



Vandalism Protection



Hydraulic Drive

ORIGINAL

SOLD TO

[illegible]

[illegible]
[illegible] SOUTH [illegible] RD.
HUTTO TX 78634

DRIVER ON ☐ OFF ☐

10248

DATE	CUST. NO.	P.O. NO.	TRUCK NO.	TICKET NO.
[illegible]			[illegible]	[illegible]

MAT. NO.	DESCRIPTION	CONTRACT NO.	PIT / PLANT
1	~~PNEUMATIC~~ ROLLER	1	[illegible]

~~Tandem~~
Pneumatic

UNIT PRICE .00	TIME 12:53
NET PRICE .00	LOAD NO. 1
TAX TOTAL .00	GROSS WT 12.37 tons
GRAND TOTAL .00	TARE WT 12.37 tons
	NET WT .00 tons
	JOB TOTAL .00 tons

TERESA HUGHES

SCALEMASTER

DRIVER_____

HWY No. US175 PROJECT # FR136(24) CONTROL # 01970304

DATE	DAY OF WEEK	TYPE ASPHALT	AIR TEMP.	ASPHALT MIX TEMP. F
9-20-91	(FRI)	340 TYB RECYCLE	55° TO 66°F	290°
9-21-91	(SAT)	340 TYB RECYCLE	55° TO 81°F	300°
9-24-91	(TUES.)	340 TYB RECYCLE	55° TO 67°F	290°
9-25-91	(WED)	340 TYB RECYCLE	59° TO 79°F	290°
9-26-91	(THU)	340 TYC RECYCLE	69° TO 82°F	290°
9-27-91	(FRI)	340 TYB RECYCLE	66° TO 82°F	295°
10-16-91	(WED)	340 TYB VIRGIN MIX @ LATEX	53° TO 82°F	330°
10-17-91	(THU)	340 TYB VIRGIN MIX @ LATEX	57° TO 84°F	340°
10-18-91	(FRI)	340 TYB VIRGIN MIX @ LATEX	62° TO 89°F	320°
10-19-91	(SAT)	340 TYB VIRGIN MIX @ LATEX	64° TO 86°F	335°
10-21-91	(MON)	340 TYC VIRGIN MIX @ LATEX	57° TO 84°F	330°
11-6-91	(WED)	340 TYB VIRGIN MIX @ LATEX	36° TO 59°F	310°
11-8-91	(FRI)	340 TYB VIRGIN MIX @ LATEX	26° TO 67°F	320°

Post-it™ brand fax transmittal memo 7671 # of pages ▸ 1

To Jerry Daleiden	From Gary D. Charlton
Co. BRE	Co. TxDOT
Dept.	Phone # (214) 932-3617
Fax # (512) 346-8750	Fax # (214) 932-4860

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 2]

LAYER THICKNESS MEASUREMENTS (Inches)

SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
0+00	0				1.8	
	36				2.5	
	72				1.7	
	108				2.0	
	144				2.2	
0+50	0				2.0	
	36				2.6	
	72				2.2	
	108				2.5	
	144				2.4	
1+00	0				2.0	
	36				2.8	
	72				2.2	
	108				2.4	
	144				2.5	
1+50	0				2.2	
	36				2.4	
	72				1.9	
	108				2.2 ~~2.8~~	
	144				2.3	
2+00	0				1.8	
	36				2.5	
	72				1.9	
	108				2.5	
	144				2.4	
2+50	0				1.9	
	36				2.8	
	72				1.9	
	108				2.8	
	144				2.4	
3+00	0				2.2	
	36				2.4	
	72				2.0	
	108				2.3	
	144				2.6	
LAYER NUMBER					06	

PREPARER [signature] EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 2]

LAYER THICKNESS MEASUREMENTS (Inches)

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
3+50	0				2.0	
	36				2.5	
	72				1.8	
	108				2.3	
	144				2.8	
4+00	0				1.8	
	36				2.8	
	72				2.0	
	108				2.5	
	144				2.5	
4+50	0				1.9	
	36				2.4	
	72				1.8	
	108				2.5	
	144				2.6	
5+00	0				2.2	
	36				2.9	
	72				2.2	
	108				2.9	
	144				2.8	
5+50						
+						
+						
LAYER NUMBER					06	

MEAN 2.3
STD DEV. 0.3

PREPARER [signature] EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA MISCELLANIOUS CONSTRUCTION NOTES AND COMMENTS CONSTRUCTION DATA SHEET 11	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 2]

Provide any miscellanious comments and notes concering construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indicatation of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

No "SURFACE PREPARATION" (CONSTRUCTION DATA SHEETS 3 & 4)
WAS APPLIED TO THIS SECTION

No "RUT LEVEL-UP TREATMENT" (CONSTRUCTION DATA SHEET 5)
WAS APPLIED TO THIS SECTION

STARTED PAVING RAP SURFACE @ 0-101' OF 48A502
FINISHED PAVING RAP SURFACE @ 5+150' OF 48A503
BEGAN @ 9:30 AND FINISHED @ 2:10 (ALL ON 9/26/91)
(INCLUDED SECTIONS 2, 9, 8 & 3)

PREPARER [signature] EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA REVISED LAYER DESCRIPTIONS CONSTRUCTION DATA SHEET 2	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 3]

1. LAYER NUMBER	2. LAYER DESCRIPTION	3. MATERIAL TYPE CLASS	4. LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 1]				
2	[0 6]	[3 6]	[10.0]	---	---	---
3	[0 5]	[2 3]	[11.0]	---	---	---
4	[0 4]	[2 8]	[8.0]	---	---	---
5	[0 3]	[0 1]	[1.5]	---	---	---
6	[0 4]	[3 4]	[2.8]	2.2	3.5	0.3
7	[0 1]	[1 3]	[2.1]	1.6	2.6	0.2
8	[ ]	[ ]	[ ]	---	---	---
9	[ ]	[ ]	[ ]	---	---	---
10	[ ]	[ ]	[ ]	---	---	---
11	[ ]	[ ]	[ ]	---	---	---
12	[ ]	[ ]	[ ]	---	---	---
13	[ ]	[ ]	[ ]	---	---	---
14	[ ]	[ ]	[ ]	---	---	---
15	[ ]	[ ]	[ ]	---	---	---

NOTES:

1. Layer 1 is subgrade soil, the highest numbered layer is the pavement surface.
2. Layer description codes:

Overlay.....01	Base Layer.....05	Porous Friction Course..09
Seal/Tack Coat.....02	Subbase Layer.....06	Surface Treatment.....10
Original Surface.....03	Subgrade.....07	Embankment (Fill).....11
HMAC Layer (Subsurface).04	Interlayer.....08	

If milling was performed, the layers which were milled shall be assigned their previous layer number and material type. If the layer was completely removed by milling, it shall still be shown as a layer with a zero thickness.

3. Enter the material type classification codes from Tables A.5, A.6, A.7 and A.8 which best describes the material in each layer. If the layer was milled, enter the material classification code corresponding to the type material which was removed.
4. Enter the average thickness of each layer and the maximum, minimum, and standard deviation of the thickness measurements, if known. If a layer was partially milled, the remaining thickness of the layer shall be indicated.

PREPARER [signature] BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA OVERLAY PLACEMENT OPERATIONS CONSTRUCTION DATA SHEET 7	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 3]

1. DATE SURFACE PREPARATION BEGAN (Month-Day-Year) [0 9-2 1-9 1]
2. DATE SURFACE PREPARATION COMPLETED [0 9-2 1-9 1]

3. SURFACE PREPARATION PRIOR TO PLACEMENT OF OVERLAY [3]
   None..... 1 Broomed..... 2 Broomed + Asphaltic Tack Coat.... 3
   Asphaltic Tack Coat (only).... 4

4. TACK COAT
   Layer Numbers [_ _] [1 0]
   Material Type None..... 1 SS-1.... 2 SS-1H.... 3 CRS-1.... 4 [_ _]
   CRS-2.... 5 CMS-2.... 6 CMS-2H.. 7 CSS-1.... 8 CSS-1H... 9
   Other.... 10 (Specify) RC-250
5. TACK COAT DILUTION
   (Percent) [_ _]
   Mixing Rate Parts Diluent ___ TO Parts Asphalt ___
6. TACK COAT APPLICATION RATE (Gal/Sq. Yd.) [0 . 0 2]

7. ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers
Plant 1	[2]	AZTEC SUPER SIX PACK	[_ 1 9]	[2 5]	[6] [7] [_]
Plant 2	[_]	_____	[_ _ _]	[_ _]	[_] [_] [_]
Plant 3	[_]	_____	[_ _ _]	[_ _]	[_] [_] [_]

   Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify_____

8. MANUFACTURER OF ASPHALT CONCRETE PAVER BARBER GREENE

9. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER BG-260

10. SINGLE PASS LAYDOWN WIDTH (Feet) 11.6 1ST LIFT, 12.0 2ND LIFT, 12.5 SURFACE [1 2.5]

11. AC BINDER COURSE LIFT
    Layer Number [_ 6]
    Nominal First Lift Placement Thickness (Inches) [1.4]
    Nominal Second Lift Placement Thickness (Inches) [1.4]
12. AC SURFACE COURSE LIFT
    Layer Number [0 7]
    Nominal First Lift Placement Thickness (Inches) [2.1]
    Nominal Second Lift Placement Thickness (Inches) ~~[_.__]~~
13. SURFACE FRICTION COURSE
    Layer Number ~~[_ _]~~
    Nominal Placement Thickness (Inches) ~~[_.__]~~
14. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
    Binder Course ~~[_+_ _]~~
    Surface Course ~~[_+_ _]~~
    Surface Friction Course ~~[_+_ _]~~
15. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2 (specify offset from O/S feet) ~~[_ _.__]~~

16. SIGNIFICANT EVENTS DURING CONSTRUCTION(disruptions, rain, equip. problems, etc.)
    RMU 9/23/91

PREPARER [signature] EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 3	* STATE CODE [4 8] * SPS PROJECT CODE [1 5] * TEST SECTION NO. [0 3]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9 - 2 1 - 9 1]
2. DATE PAVING OPERATIONS COMPLETED [0 9 - 2 5 - 9 1]

3. LAYER NUMBER [6]

4. MIXING TEMPERATURE (°F) [_ _ _.]

5. LAYDOWN TEMPERATURES (°F)
   Mean..... 293.
   Minimum..... _ _ _.
   Standard Deviation... _ _.
   Number of Tests ..... _ _.
   Maximum..... _ _ _.

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH 48A502)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	10.1				
7	B	Steel-Whl Tandem	_ _._				
8	C	Steel-Whl Tandem	_ _._				
9	D	Steel-Whl Tandem	_ _._				
10	E	Pneumatic-Tired	12.4	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._				
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _._	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _._	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _._	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _._	_ _._
18	M	Double-Drum Vibr.	10.1		_ _ _ _.	_ _ _._	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _._	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _._	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _._	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	M	_	_
24	Coverages	_ 3.	_ 3.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	E	_	_
26	Coverages	_ 6.	_ 6.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	A	_	_
28	Coverages	_ 2.	_ 2.	_ _.	_ _.
29	Air Temperature (°F)	_ 80.	_ 75.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	1.4	1.4	_._	_._
31	Curing Period (Days)	_ 0.1	_ 0.1	_ _._	_ _._

PREPARER [signature] ERC DATE

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 8	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 3]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [09-26-91]
2. DATE PAVING OPERATIONS COMPLETED [09-26-91]

3. LAYER NUMBER [7]

4. MIXING TEMPERATURE (°F) [_ _ _.]

5. LAYDOWN TEMPERATURES (°F)
   Mean..... 280. Number of Tests ..... _ _.
   Minimum..... _ _ _. Maximum..... _ _ _.
   Standard Deviation... _ _.

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH 48A502)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	10.1				
7	B	Steel-Whl Tandem	_ _._				
8	C	Steel-Whl Tandem	_ _._				
9	D	Steel-Whl Tandem	_ _._				
10	E	Pneumatic-Tired	12.4	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._				
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
18	M	Double-Drum Vibr.	10.1		_ _ _ _.	_ _ _	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	_	_	_
24	Coverages	_ 3.	_ _.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	_	_	_
26	Coverages	_ 6.	_ _.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	_	_	_
28	Coverages	_ 2.	_ _.	_ _.	_ _.
29	Air Temperature (°F)	_ 80.	_ _ _.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	2.1	_._	_._	_._
31	Curing Period (Days)	_ 0.1	_ _._	_ _._	_ _._

PREPARER [signature] EMPLOYER BRE DATE _____

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 3]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
0+00	0	.	.	2.2	2.0	.
	36	.	.	2.9	2.0	.
	72	.	.	2.5	2.0	.
	108	.	.	2.8	2.0	.
	144	.	.	2.5	1.9	.
0+50	0	.	.	2.5	2.3	.
	36	.	.	3.0	1.9	.
	72	.	.	2.3	2.0	.
	108	.	.	2.6	1.9	.
	144	.	.	2.5	1.9	.
1+00	0	.	.	3.0	1.9	.
	36	.	.	3.2	2.0	.
	72	.	.	2.6	2.2	.
	108	.	.	3.1	2.0	.
	144	.	.	3.2	1.9	.
1+50	0	.	.	2.9	2.2	.
	36	.	.	3.1	2.3	.
	72	.	.	2.8	2.0	.
	108	.	.	3.2	1.8	.
	144	.	.	3.5	1.6	.
2+00	0	.	.	2.9	2.0	.
	36	.	.	3.2	1.9	.
	72	.	.	2.6	1.8	.
	108	.	.	3.0	1.8	.
	144	.	.	2.8	1.6	.
2+50	0	.	.	3.2	2.2	.
	36	.	.	3.5	2.0	.
	72	.	.	2.4	1.9	.
	108	.	.	2.8	2.2	.
	144	.	.	2.6	1.9	.
3+00	0	.	.	2.9	2.2	.
	36	.	.	3.1	2.2	.
	72	.	.	2.4	2.0	.
	108	.	.	2.6	2.3	.
	144	.	.	2.6	2.0	.
LAYER NUMBER				06	07	

PREPARER Jerome F. Dill BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 3]

LAYER THICKNESS MEASUREMENTS (Inches)

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
3+50	0			2.9	2.3	
	36			3.0	2.3	
	72			2.2	2.4	
	108			2.5	2.5	
	144			2.5	2.4	
4+00	0			2.8	2.4	
	36			3.1	2.6	
	72			2.2	2.5	
	108			2.8	2.4	
	144			2.8	2.2	
4+50	0			3.0	2.3	
	36			3.1	2.5	
	72			2.4	2.3	
	108			2.6	2.3	
	144			2.6	2.0	
5+00	0			2.5		
	36			3.1	2.0	
	72			2.3	2.3	
	108			2.4	2.4	
	144			2.5	2.3	
+__						
+__						
+__						
LAYER NUMBER				06	07	
			MEAN	2.8	2.11	
			σ	0.3	0.23	

PREPARER Jerome T. Dallas EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA MISCELLANIOUS CONSTRUCTION NOTES AND COMMENTS CONSTRUCTION DATA SHEET 11	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 3]

Provide any miscellanious comments and notes concering construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indicatation of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

No "Surface Preparation" (Construction Data Sheets 3 & 4)
was applied to this section

No "Rut Level-up Treatment" (Construction Data Sheet 5)
was applied to this section

Started Paving 1st lift of Rap Binder @ 0-77' of 48A508
Finished Paving 1st lift of Rap Binder @ 5+100' of 48A503
Began & Finished on 9/21/91 (included sections 8 & 3)
- No SHRP Rep. present
- No complications reported

Started Paving 2nd lift of Rap Binder @ 0-100' of 48A508
Finished Paving 2nd lift of Rap Binder @ 5+130' of 48A503
Began @ 12:30 and finished @ 2:00 (all on 9/25/91)
- included sections 8 & 3

Started Paving Rap Surface @ 0-101' of 48A502
Finished Paving Rap Surface @ 5+150' of 48A503
Began @ 9:30 and finished @ 2:10 (all on 9/26/91)
- included sections 2, 9, 8 & 3

PREPARER Jerome C. Dell EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA REVISED LAYER DESCRIPTIONS CONSTRUCTION DATA SHEET 2	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 4]

1. LAYER NUMBER	2. LAYER DESCRIPTION	3. MATERIAL TYPE CLASS	4. LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 1]				
2	[0 6]	[3 6]	[10.0]	- - -.-	- - -.-	- - -.-
3	[0 5]	[2 3]	[11.0]	- - -.-	- - -.-	- - -.-
4	[0 4]	[2 8]	[8.0]	- - -.-	- - -.-	- - -.-
5	[0 3]	[0 1]	[1.5]	- - -.-	- - -.-	- - -.-
6	[0 4]	[2 8]	[3.0]	2.4	3.7	0.3
7	[0 1]	[0 1]	[1.9]	1.2	2.4	0.2
8	[ ]	[ ]	[-.-]	- - -.-	- - -.-	- - -.-
9	[ ]	[ ]	[-.-]	- - -.-	- - -.-	- - -.-
10	[ ]	[ ]	[-.-]	- - -.-	- - -.-	- - -.-
11	[ ]	[ ]	[-.-]	- - -.-	- - -.-	- - -.-
12	[ ]	[ ]	[-.-]	- - -.-	- - -.-	- - -.-
13	[ ]	[ ]	[-.-]	- - -.-	- - -.-	- - -.-
14	[ ]	[ ]	[-.-]	- - -.-	- - -.-	- - -.-
15	[ ]	[ ]	[-.-]	- - -.-	- - -.-	- - -.-

NOTES:

1. Layer 1 is subgrade soil, the highest numbered layer is the pavement surface.
2. Layer description codes:

Overlay.....01	Base Layer.....05	Porous Friction Course..09
Seal/Tack Coat.....02	Subbase Layer.....06	Surface Treatment.....10
Original Surface.....03	Subgrade.....07	Embankment (Fill).....11
HMAC Layer (Subsurface).04	Interlayer.....08	

If milling was performed, the layers which were milled shall be assigned their previous layer number and material type. If the layer was completely removed by milling, it shall still be shown as a layer with a zero thickness.

3. Enter the material type classification codes from Tables A.5, A.6, A.7 and A.8 which best describes the material in each layer. If the layer was milled, enter the material classification code corresponding to the type material which was removed.
4. Enter the average thickness of each layer and the maximum, minimum, and standard deviation of the thickness measurements, if known. If a layer was partially milled, the remaining thickness of the layer shall be indicated.

PREPARER Jerome F. Dell BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA OVERLAY PLACEMENT OPERATIONS CONSTRUCTION DATA SHEET 7	* STATE CODE [4 8] * SPS PROJECT CODE [1 5] * TEST SECTION NO. [0 4]

1. DATE SURFACE PREPARATION BEGAN (Month-Day-Year) [1 0-1 7-9 1]
2. DATE SURFACE PREPARATION COMPLETED [1 0-1 7-9 1]

3. SURFACE PREPARATION PRIOR TO PLACEMENT OF OVERLAY [3]
   None..... 1 Broomed..... 2 Broomed + Asphaltic Tack Coat.... 3
   Asphaltic Tack Coat (only).... 4

4. TACK COAT
   Layer Numbers [_ _] [1 0]
   Material Type None..... 1 SS-1.... 2 SS-1H.... 3 CRS-1.... 4 [_ _]
   CRS-2.... 5 CMS-2.... 6 CMS-2H.. 7 CSS-1.... 8 CSS-1H... 9
   Other.... 10 (Specify) RC-250
5. TACK COAT DILUTION
   (Percent) [_ _]
   Mixing Rate Parts Diluent ___ TO Parts Asphalt ___
6. TACK COAT APPLICATION RATE (Gal/Sq. Yd.) [0.0 2]

7. ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers		
Plant 1	[2]	AZTEC, SUPER SIX PACK	[_ 1 9]	[2 5]	[6]	[7]	[_]
Plant 2	[_]		[_ _ _]	[_ _]	[_]	[_]	[_]
Plant 3	[_]		[_ _ _]	[_ _]	[_]	[_]	[_]

   Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify_____

8. MANUFACTURER OF ASPHALT CONCRETE PAVER BARBER GREENE
9. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER SB-140
10. SINGLE PASS LAYDOWN WIDTH (Feet) 1ST LIFT 12.5 / 2ND LIFT 13.0 / SURFACE 12.5 [1 2.5]
11. AC BINDER COURSE LIFT
    Layer Number [0 6]
    Nominal First Lift Placement Thickness (Inches) [1.5]
    Nominal Second Lift Placement Thickness (Inches) [1.5]
12. AC SURFACE COURSE LIFT
    Layer Number [0 7]
    Nominal First Lift Placement Thickness (Inches) [1.9]
    Nominal Second Lift Placement Thickness (Inches) ~~[_.__]~~
13. SURFACE FRICTION COURSE
    Layer Number ~~[_ _]~~
    Nominal Placement Thickness (Inches) ~~[_.__]~~
14. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
    Binder Course ~~[_ + _ _]~~
    Surface Course ~~[_ + _ _]~~
    Surface Friction Course ~~[_ + _ _]~~
15. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2 (specify offset from O/S feet) ~~[_ _._]~~

16. SIGNIFICANT EVENTS DURING CONSTRUCTION(disruptions, rain, equip. problems, etc.)

PREPARER Jerome F. Dahl EMPLOYER BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA
OVERLAY COMPACTION DATA
CONSTRUCTION DATA SHEET 3

* STATE CODE [4 8]
* SPS PROJECT CODE [A 3]
* TEST SECTION NO. [0 4]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [1 0-2 1-9 1]
2. DATE PAVING OPERATIONS COMPLETED [1 0-2 1-9 1]

3. LAYER NUMBER [7]

4. MIXING TEMPERATURE (°F) [_ _ _]

5. LAYDOWN TEMPERATURES (°F)
   Mean..... 3 3 0.
   Minimum..... _ _ _.
   Standard Deviation... _ _.
   Number of Tests ..... _ _
   Maximum..... _ _ _

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH HBASCS)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	8.3				
7	B	Steel-Whl Tandem	_ _..				
8	C	Steel-Whl Tandem	_ _..				
9	D	Steel-Whl Tandem	_ _..				
10	E	Pneumatic-Tired	9.9	_ _ _ _.			
11	F	Pneumatic-Tired	_ _..	_ _ _ _.			
12	G	Pneumatic-Tired	_ _..	_ _ _ _.			
13	H	Pneumatic-Tired	_ _..				
14	I	Single-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
15	J	Single-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
16	K	Single-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
17	L	Single-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
18	M	Double-Drum Vibr.	7.8		_ _ _ _.	_ _ _	_ _..
19	N	Double-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
20	O	Double-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
21	P	Double-Drum Vibr.	_ _..		_ _ _ _.	_ _ _	_ _..
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	_	_	_
24	Coverages	_ 3.	_ _.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	_	_	_
26	Coverages	_ 6.	_ _.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	_	_	_
28	Coverages	_ 2.	_ _.	_ _.	_ _.
29	Air Temperature (°F)	8 0.	_ _ _.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	1.9	_..	_..	_..
31	Curing Period (Days)	_ 0.1	_ _..	_ _..	_ _..

PREPARER Terrence P. Ole BRE DATE _____

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 8	* STATE CODE [4 8] * SPS PROJECT CODE [9 5] * TEST SECTION NO. [0 4]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [1 0-1 7-9 1]
2. DATE PAVING OPERATIONS COMPLETED [1 0-1 8-9 1]
3. LAYER NUMBER [6]
4. MIXING TEMPERATURE (°F) [_ _ _.]
5. LAYDOWN TEMPERATURES (°F)
   Mean..... 3 3 0.
   Minimum..... _ _ _.
   Standard Deviation... _ _.
   Number of Tests ..... _ _.
   Maximum..... _ _ _.

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH 484505)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	8.3				
7	B	Steel-Whl Tandem	_ _._				
8	C	Steel-Whl Tandem	_ _._				
9	D	Steel-Whl Tandem	_ _._				
10	E	Pneumatic-Tired	9.9	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._				
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
18	M	Double-Drum Vibr.	7.8		_ _ _ _.	_ _ _	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	M	_	_
24	Coverages	_ 3.	_ 3.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	E	_	_
26	Coverages	_ 6.	_ 6.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	A	_	_
28	Coverages	_ 2.	_ 2.	_ _.	_ _.
29	Air Temperature (°F)	8 0.	8 5.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	1.5	1.5	_._	_._
31	Curing Period (Days)	_ 0.1	_ 0.1	_ _._	_ _._

PREPARER [signature] EMPLOYER ERE DATE _____

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 4]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
+						
0+00	0			2.4	2.2	
	36			3.1	1.9	
	72			2.5	1.8	
	108			2.9	1.7	
	144			2.9	1.7	
0+50	0			2.6	1.4	
	36			3.2	1.2	
	72			2.8	1.4	
	108			2.8	1.7	
	144			2.8	1.8	
1+00	0			2.9	2.0	
	36			3.5	1.9	
	72			2.8	1.8	
	108			2.9	2.0	
	144			2.5	2.2	
1+50	0			2.9	2.0	
	36			3.6	1.8	
	72			2.5	1.8	
	108			2.9	1.9	
	144			2.9	1.9	
2+00	0			3.1	1.8	
	36			3.7	1.7	
	72			2.6	1.8	
	108			2.9	2.0	
	144			3.2	1.8	
2+50	0			2.9	2.2	
	36			3.5	2.2	
	72			3.0	1.8	
	108			3.2	1.8	
	144			3.4	1.8	
LAYER NUMBER				6	7	

PREPARER Jerome F. [illegible] E.29 BRC DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 4]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
3+00	0		~~2.9~~	2.9	2.3	
	36		~~3.2~~	3.2	1.9	
	72		~~2.6~~	2.6	2.0	
	108		~~2.8~~	2.8	2.2	
	144		~~3.0~~	3.0	1.9	
3+50	0			2.8	2.3	
	36			3.5	1.7	
	72			3.0	1.7	
	108			3.1	1.8	
	144			3.2	1.7	
4+00	0			3.0	2.4	
	36			3.4	1.9	
	72			2.9	1.9	
	108			2.8	2.0	
	144			3.0	1.9	
4+50	0			2.9	2.2	
	36			3.4	1.8	
	72			2.8	1.8	
	108			2.9	1.9	
	144			3.0	1.9	
5+00	0			2.9	2.0	
	36			3.1	1.7	
	72			2.4	1.7	
	108			2.5	1.8	
	144			2.8	1.9	
+						
+						
LAYER NUMBER				6	7	

MEAN 2.96 1.88
SD 0.30 0.22

PREPARER Jerome R. Dill EMPLOYER BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA MISCELLANIOUS CONSTRUCTION NOTES AND COMMENTS CONSTRUCTION DATA SHEET 11	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 4]

Provide any miscellanious comments and notes concering construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indicatation of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

No "Surface Preparation" (Construction Data Sheets 3 & 4)
was applied to this section

No "Rut Level-up Treatment" (Construction Data Sheets 5)
was applied to this section

Started Paving 1st lift of Virgin Binder @ 0-64 of 48A504
Finished Paving 1st lift of Virgin Binder @ 5+122 of 48A507
Began @ 1:00 and finished @ 3:30 (all on 10/17/91)
— included sections 4 & 7

Started Paving 2nd lift of Virgin Binder @ 0-84 of 48A504
Finished Paving 2nd lift of Virgin Binder @ 5+148 of 48A507
Began @ 2:30 and finished @ 5:00 (all on 10/18/91)
— included sections 4 & 7

Started Paving Virgin Surface @ 0-124 of 48A504
Finished Paving Virgin Surface @ 5+65 of 48A505
Began @ 1:30 and finished @ 5:30 (all on 10/21/91)
— included sections 4, 7, 6 & 5

PREPARER Jerome E. Dahl BRB DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA REVISED LAYER DESCRIPTIONS CONSTRUCTION DATA SHEET 2	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 5]

1. LAYER NUMBER	2. LAYER DESCRIPTION	3. MATERIAL TYPE CLASS	4. LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 1]				
2	[0 6]	[3 6]	[10.0]	---.-	---.-	---.-
3	[0 5]	[2 3]	[11.0]	---.-	---.-	---.-
4	[0 4]	[2 8]	[8.0]	---.-	---.-	---.-
5	[0 3]	[0 1]	[1.5]	---.-	---.-	---.-
6	[0 1]	[0 1]	[2.3]	1.2	3.1	0.4
7	[ ]	[ ]	[---.-]	---.-	---.-	---.-
8	[ ]	[ ]	[---.-]	---.-	---.-	---.-
9	[ ]	[ ]	[---.-]	---.-	---.-	---.-
10	[ ]	[ ]	[---.-]	---.-	---.-	---.-
11	[ ]	[ ]	[---.-]	---.-	---.-	---.-
12	[ ]	[ ]	[---.-]	---.-	---.-	---.-
13	[ ]	[ ]	[---.-]	---.-	---.-	---.-
14	[ ]	[ ]	[---.-]	---.-	---.-	---.-
15	[ ]	[ ]	[---.-]	---.-	---.-	---.-

NOTES:

1. Layer 1 is subgrade soil, the highest numbered layer is the pavement surface.
2. Layer description codes:

Overlay.....01	Base Layer.....05	Porous Friction Course..09
Seal/Tack Coat.....02	Subbase Layer.....06	Surface Treatment.....10
Original Surface.....03	Subgrade.....07	Embankment (Fill).....11
HMAC Layer (Subsurface).04	Interlayer.....08	

If milling was performed, the layers which were milled shall be assigned their previous layer number and material type. If the layer was completely removed by milling, it shall still be shown as a layer with a zero thickness.

3. Enter the material type classification codes from Tables A.5, A.6, A.7 and A.8 which best describes the material in each layer. If the layer was milled, enter the material classification code corresponding to the type material which was removed.
4. Enter the average thickness of each layer and the maximum, minimum, and standard deviation of the thickness measurements, if known. If a layer was partially milled, the remaining thickness of the layer shall be indicated.

PREPARER [signature] E.32 BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA OVERLAY PLACEMENT OPERATIONS CONSTRUCTION DATA SHEET 7	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 5]

1. DATE SURFACE PREPARATION BEGAN (Month-Day-Year) [10-21-91]
2. DATE SURFACE PREPARATION COMPLETED [10-21-91]

3. SURFACE PREPARATION PRIOR TO PLACEMENT OF OVERLAY [3]
   None..... 1 Broomed..... 2 Broomed + Asphaltic Tack Coat.... 3
   Asphaltic Tack Coat (only).... 4

4. TACK COAT
   Layer Numbers [__ __] [1 0]
   Material Type None..... 1 SS-1.... 2 SS-1H.... 3 CRS-1.... 4 [__ __]
   CRS-2.... 5 CMS-2.... 6 CMS-2H.. 7 CSS-1.... 8 CSS-1H... 9
   Other.... 10 (Specify) RC-250
5. TACK COAT DILUTION
   (Percent) [__ __]
   Mixing Rate Parts Diluent ___ TO Parts Asphalt ___
6. TACK COAT APPLICATION RATE (Gal/Sq. Yd.) [0.02]

7. ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers		
Plant 1	[2]	AZTEC, SUPER SIX PACK	[19]	[25]	[6]	[__]	[__]
Plant 2	[__]		[__ __ __]	[__ __]	[__]	[__]	[__]
Plant 3	[__]		[__ __ __]	[__ __]	[__]	[__]	[__]

   Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify

8. MANUFACTURER OF ASPHALT CONCRETE PAVER BARBER GREENE
9. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER SB-140
10. SINGLE PASS LAYDOWN WIDTH (Feet) SURFACE [12.5]

11. AC BINDER COURSE LIFT
    Layer Number [__ __]
    Nominal First Lift Placement Thickness (Inches) [__ __]
    Nominal Second Lift Placement Thickness (Inches) [__.__]
12. AC SURFACE COURSE LIFT
    Layer Number [07]
    Nominal First Lift Placement Thickness (Inches) [2.3]
    Nominal Second Lift Placement Thickness (Inches) [__.__]
13. SURFACE FRICTION COURSE
    Layer Number [__ __]
    Nominal Placement Thickness (Inches) [__.__]
14. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
    Binder Course [__ + __ __]
    Surface Course [__ + __ __]
    Surface Friction Course [__ + __ __]
15. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2 (specify offset from O/S feet) [__ __.__]

16. SIGNIFICANT EVENTS DURING CONSTRUCTION(disruptions, rain, equip. problems, etc.)

PREPARER [signature] EMPLOYER BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 3	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 5]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [1 0-2 1-9 1]
2. DATE PAVING OPERATIONS COMPLETED [1 0-2 1-9 1]
3. LAYER NUMBER [6]
4. MIXING TEMPERATURE (°F) [_ _ _]
5. LAYDOWN TEMPERATURES (°F)
   Mean..... 3 3 0. Number of Tests ..... _ _
   Minimum..... _ _ _. Maximum..... _ _ _
   Standard Deviation... _ _.

ROLLER DATA (USE ATTACHED FOR ORIGINAL DATA ON ROLLERS)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	8 3				
7	B	Steel-Whl Tandem	_ _._				
8	C	Steel-Whl Tandem	_ _._				
9	D	Steel-Whl Tandem	_ _._				
10	E	Pneumatic-Tired	9 9	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._				
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
18	M	Double-Drum Vibr.	7 8		_ _ _ _.	_ _ _	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	_	_	_
24	Coverages	_ 3.	_ _.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	_	_	_
26	Coverages	_ 6.	_ _.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	_	_	_
28	Coverages	_ 2.	_ _.	_ _.	_ _.
29	Air Temperature (°F)	8 0.	_ _ _.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	2.3	_._	_._	_._
31	Curing Period (Days)	_ 0.1	_ _._	_ _._	_ _._

PREPARER Jerome F. Dill

BRL

DATE

VIRGIN

SPECIFICATIONS

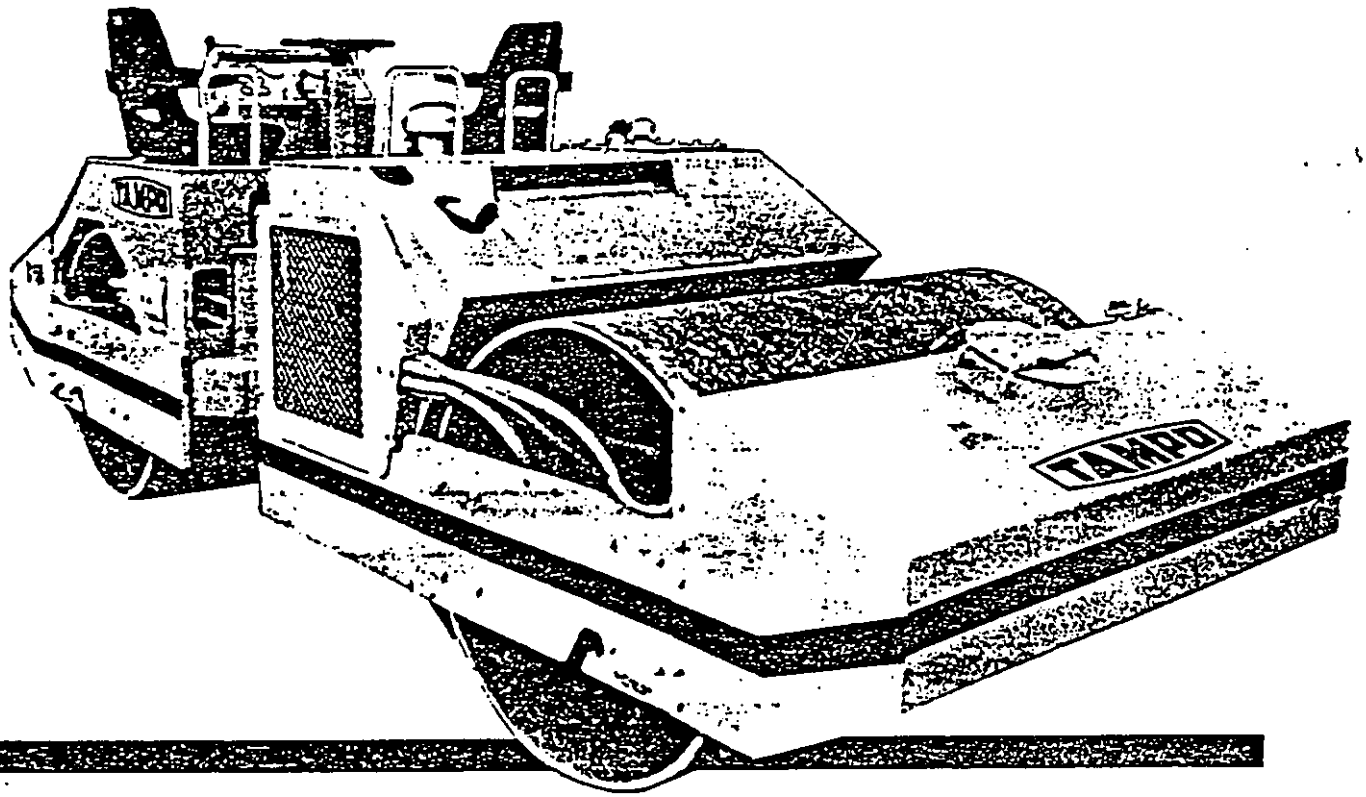
Brown & Root

BREAKDOWN ROLLER 7.3

TAMPO

RS-156A

DUAL DRUM VIBRATORY ROLLER



- **ASPHALT/ SUBGRADE**
- **PARKING LOTS**
- **LANE WIDENING**
- **INDUSTRIAL DEVELOPMENTS**
- **CONFINED AREAS**

- High frequency vibration results in fast compaction of asphalt.
- Three amplitude settings per drum to facilitate full spectrum of applications from thin tender mixes to thick stiff mats.
- 7-ton static roller capacity.
- Electric over hydraulic, infinitely variable travel control provides smooth, easy acceleration and easy operation.
- Vibratory operation features: Automatic reversing eccentrics, automatic start/stop, lead/trail selection and automatic vibratory cutoff at pre-selected travel speed, all coupled with a single lever travel control for error free simplicity of operation.
- Dual seat operator's platform and tilt steering wheel provide excellent visability.
- Lockable control console in easy reach and view comprises full range of instrumentation, including speedometer and vibrator tachometer.
- 160 gallon water supply system, features full-time application or equal on/off duration application, adjustable from .2 to 20 seconds to conserve water supply and increase available operating time.
- Smooth side design provides 4-inch curb clearance on both sides of roller combined with the operator's ability to see both edges of both rolls providing easy close quarter operation.
- LCG design and superior operator visability lend to safer operation.
- Automatic brakes apply when engine stops or hydraulic system fails which enhances safe operation.

RS-156A

DUAL DRUM VIBRATORY ROLLER

WEIGHTS	AMERICAN STANDARD	METRIC
Shipping weight	14050 lbs.	6374 kg
Working weight	14900 lbs.	6759 kg
Weight per drum	7450 lbs.	3379 kg
Weight per linear unit	133 lbs.	23.8 kg

DIMENSIONS		
Length	196 in.	4978 mm
Width	62.6 in.	1590 mm
Height	74 in.	1880 mm
Wheelbase	116 in.	2946 mm
Curb clearance	12.6 in.	320 mm
Wall clearance	3.4 in.	86 mm
Turning radius, outside	188 in.	4775 mm
Articulation, either side	40°	40°
Drum diameter	42 in.	1067 mm
Drum width	56 in.	1422 mm
Drum shell thickness	.75 in.	19 mm
Total oscillation	20°	20°

VIBRATION		
Frequency	2800 VPM	47 HZ
Amplitude		
High	.0225 in.	.57 mm
Medium	.0178 in.	.45 mm
Low	.0112 in.	.28 mm
Dynamic force/drum		
High	15000 lbs.	6804 kg
Medium	11856 lbs.	5377 kg
Low	7500 lbs.	3402 kg
Per linear unit		
High	268 lb/in.	48 kg/cm
Medium	212 lb/in.	38 kg/cm
Low	134 lb/in.	24 kg/cm
Total applied force per drum		
High	22450 lbs.	10183 kg
Medium	19306 lbs.	8756 kg
Low	14950 lbs	6781 kg
Per linear unit		
High	401 lb/in.	72 kg/cm
Medium	345 lb/in.	62 kg/cm
Low	167 lb/in.	48 kg/cm

Vibration drive — Hydraulic drive through flexible shaft to eccentrics with automatic start-stop and automatic rotation reversing. Solid state adjustable start and stop time delay.

FEATURES

A. Both drums vibrating
B. Either drum vibrating (Lead/Trail selection)
C. Both drums static

SALES & SERVICE

ENGINE

Model - John Deere 4239D — Horsepower - 78 @ 2500 RPM - 58 KW @ 2500 RPM

TRANSMISSION

Type — Hydrostatic with infinitely variable electric over hydraulic speed control through planetary final reduction.

Speed range - 0-6 MPH - 0-9.6 KPH — Gradeability, gross - 33%

STEERING

Type — Center pivot articulation, power steering

BRAKES

Service — Hydrostatic dynamic braking
Parking — Multiple disc, spring applied hydraulic release

INSTRUMENTS

Vandalism Protection	Speedometer
Voltmeter	Vibratach
Engine Temperature	Tachoumeter
Engine Oil pressure	Horn
Hydraulic oil temperature	Neutral start switch
Fuel gauge	Air restriction indicator

CAPACITY

Fuel tank	40 gallons	151 liters
Hydraulic system	29 gallons	110 liters
Engine crankcase	9 quarts	8.5 liters
Engine coolant	14 quarts	13.3 liters
Water tanks (total)	160 gallons	606 liters

FEATURES

Three amplitude settings
Smooth side design (both sides)
Water conserving, on-off cycling spray system — Adjustable from .2 to 20 seconds
Compaction range speed limiter control — Adjustable from 1 to 3 MPH
Vibratory phase control, adjustable start-stop — Relative to compaction travel speed

OPTIONS

Work lights, front and rear
Back-up alarm
Sound suppression package
Rollover protective structure

ROPS (Rollover Protective Structure) is strongly recommended for operator and equipment protection on machines that may be used in areas that could potentially cause a rollover accident.

Seat belts must be worn by the operator on machines equipped with ROPS.

TAMPO

MANUFACTURED BY
TAMPO MFG. CO., INC.
1146 W. Laurel St. P.O. Box 7248
San Antonio, Texas 78285
512/734-6621
Telex 6866607 TAMP SNT

BROWN AND ROOT U.S.A
3126 SOUTH PRECINCT RD.
HURST TX 76053

10/14/91 STATE FDM0335 10936

ROLLER VIBRATORY ROLLER I45 6600

.00 12:42

.00 1

.00 7.81 tonsh

.00 7.81 tonsl

.00 tons

.00 tons

7.81 tons

TERESA HUGHES

VIRGIN
INTERMEDIATE ROLLER

~~9.9~~ TONS
9.93

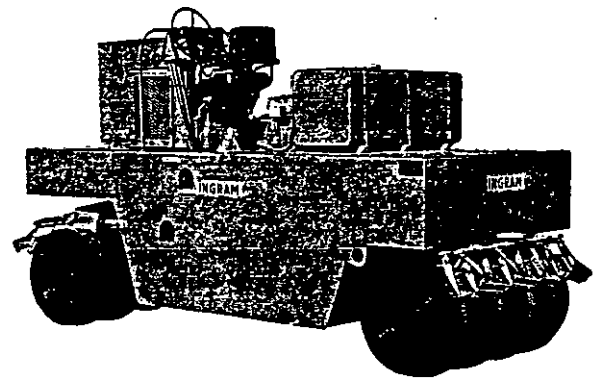
COMPACTION SPECIFICATIONS
7.50 x 15 SMOOTH COMPACTOR TIRES

9-2800-PB

BALLAST TYPE	LOAD PER TIRE		PLY	6	10	12	14
		TIRE PRESSURE	lbs/in²	60	90	110	130
			kgs/cm²	4.22	6.33	7.73	9.14
WATER	1802 lbs.	CONTACT PRESSURE	lbs/in²	54.2	65.5	74.0	84.5
			kgs./cm²	3.81	4.61	5.20	5.79
	854 kgs.	CONTACT AREA	in²	34.7	28.7	25.4	22.3
			cm²	223.9	185.2	163.9	143.9
DRY SAND	2454 lbs.	CONTACT PRESSURE	lbs/in²	57.8	70.8	78.7	89.7
			kgs./cm²	4.06	4.99	5.53	6.31
	1113 kgs.	CONTACT AREA	in²	42.5	34.7	31.2	27.4
			cm²	274.2	223.9	201.3	176.8
WET SAND	2824 lbs.	CONTACT PRESSURE	lbs/in²	60.0	74.1	81.7	43.2
			kgs./cm²	4.22	5.21	5.74	6.55
	12809 kgs.	CONTACT AREA	in²	47.0	38.1	34.6	30.3
			cm²	303.9	245.8	223.2	195.5

9-3400-PB

BALLAST TYPE	LOAD PER TIRE		PLY	6	10	12	14
		TIRE PRESSURE	lbs/in²	60	90	110	130
			kgs/cm²	4.22	6.33	7.73	9.14
WATER	2061 lbs.	CONTACT PRESSURE	lbs/in²	55.2	67.1	75.4	86.0
			kgs/cm²	3.88	4.72	5.30	6.05
	935 kgs.	CONTACT AREA	in²	37.2	30.7	27.3	24.0
			cm²	240.6	198.1	176.1	154.8
DRY SAND	2625 lbs.	CONTACT PRESSURE	lbs/in²	59.0	72.2	80.1	91.3
			kgs./cm²	4.15	5.08	5.63	6.41
	1191 kgs.	CONTACT AREA	in²	44.5	36.4	32.8	28.7
			cm²	287.1	234.8	211.6	185.2
WET SAND	3000 lbs.	CONTACT PRESSURE	lbs/in²	61.0	75.7	87.0	94.6
			kgs/cm²	4.29	5.32	6.13	6.65
	1361 kgs.	CONTACT AREA	in²	48.2	39.6	36.5	31.7
			cm²	311.0	255.5	235.5	204.5
CONC.	3444 lbs.	CONTACT PRESSURE	lbs/in²	62.2	79.0	89.7	97.6
			kgs/cm²	4.37	5.55	6.30	6.86
	1562 kgs.	CONTACT AREA	in²	43.6	43.6	40.2	35.3
			cm²	281.3	281.3	259.4	227.4



INGRAM®

INGRAM MFG. CO.
P.O. BOX 2020
SAN ANTONIO, TEXAS 78297
(512) 733-8141
FAX NO: 512 7338739

Printed U.S.A. 988
12-15-9WPB-2

Specifications subject to change without notice.

INGRAM® MODELS 9-2800-PB AND 9-3400-PB DELIVERY THE COMPETITIVE EDGE

SPEEDS

Up to 15 m.p.h. (24 km/hr.). Direction, speed and braking are controlled by a single lever.

BRAKES

Service Braking is through the hydrostatic transmission. Bringing the control lever to center will stop the flow of fluid and stop the roller.

Parking Brake is spring applied, hydraulically released.

STEERING

Full power steering control unit which provides remote rotary servo control with sensory direction and delivery measurement within the same unit.
Steering cylinder is 3" (76.2mm) diameter.

HYDROSTATIC TRANSMISSION AND POWER TRAIN

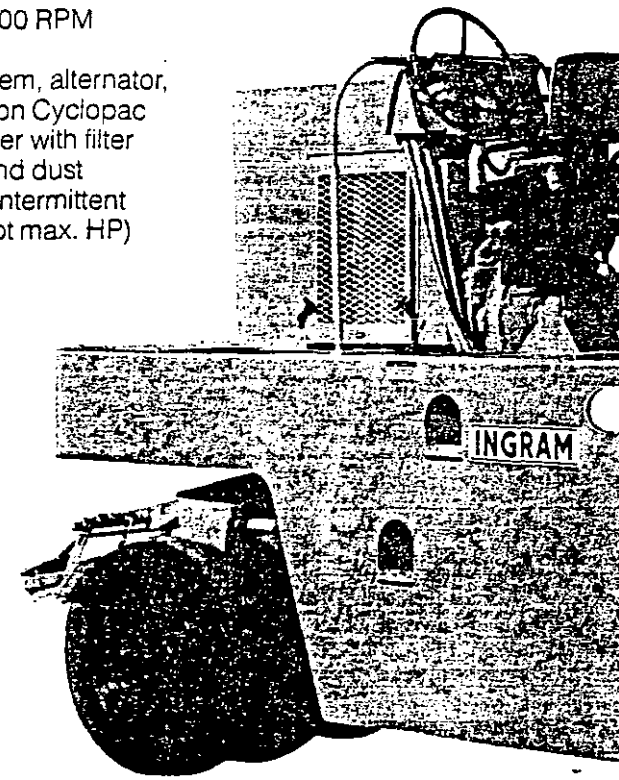
The hydrostatic transmission is composed of a variable displacement piston pump and two speed hydraulic wheel motors. In this closed loop circuit the fluid is filtered through a 10 micron filter and returned to the reservoir passing through an oil to air heat exchanger.

POWER

Ford G-300 (CSG-649)
107 SAE BHP @2400 RPM
6 cylinder gas
Detroit Diesel 3-53N
85 SAE BHP @2400 RPM
3 cylinder diesel
Cummins 4B3.9 76HP @2500 RPM
4 cylinder diesel
John Deere 4239D
80 SAE BHP @2500 RPM
4 cylinder diesel
12-volt electrical system, alternator, muffler and Donaldson Cyclopac 2 stage dry air cleaner with filter condition indicator and dust ejector. SAE BHP is intermittent at governed RPM (not max. HP)

VANDALISM PROTECTION

The engine compartment and instrument panel are provided with lockable covers. The fuel tank and sprinkler tank are also lockable.



STANDARD EQUIPMENT

Diesel engine
6 ply tires
Body baffles
Cushioned adjustable seat
Horn
ROPS mounting brackets

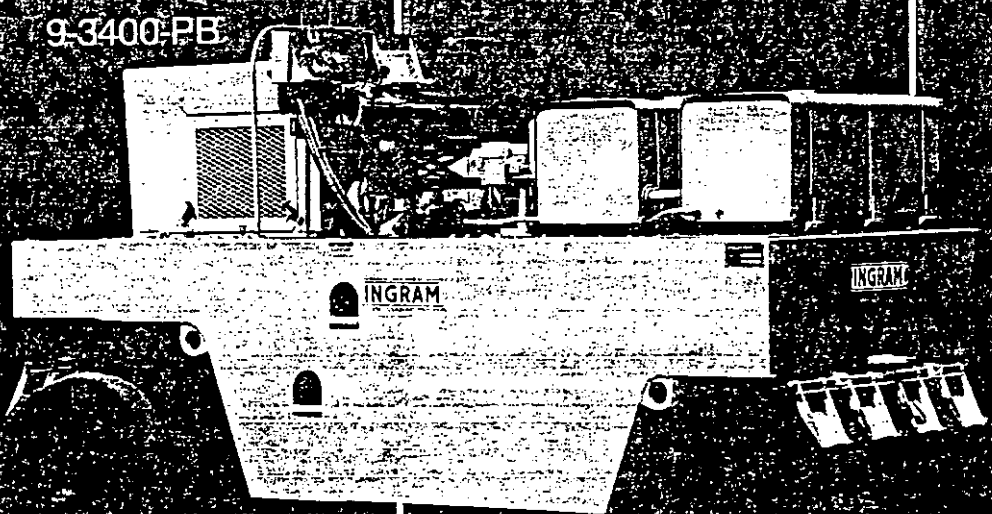
Standard Gauges:
Hour meter
Voltmeter
Engine oil pressure
Engine water temperature
Air cleaner condition indicator
Hydrostatic oil temp. gauge
Charge pressure gauge
Hydrostatic oil filter condition indicator

Lockable Cover for:
Engine
Fuel tank
Water tank
Instrument panel

INGRAM® ROLLERS

Features

- Full Wheel Oscillation removes voids by compacting material into uniform consolidation and insures uniform densities from the centerline to the shoulder.
- Total hydrostatic drive system eliminates the use of chain and sprockets, for smooth, precise roller controls.
- Speeds: 0-15 mph (24 KPH). Both speed and direction are controlled by a single lever.
- ROPS and Seat Belts optional.



12 AND 15 TON PB

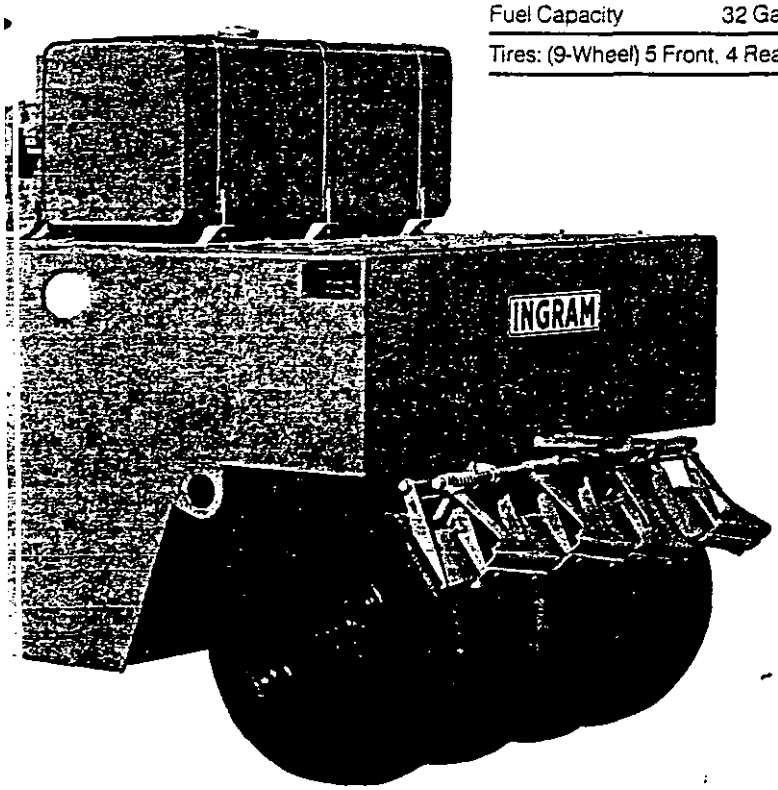
DIMENSIONS

Body Width	67"	1701.8 mm
Overall Rolling Width	68"	1727.2 mm
Length	161"	4089.4 mm
Height	94"	2387.6 mm
Height w/ROPS	121"	3073.0 mm
Wheelbase	130"	3302.0 mm
Tire Overlap	½"	12.7 mm
Turning Radius (Inside)	13'-6"	4114.8 mm
Ground Clearance	10"	254.0 mm
Fuel Capacity	32 Gal.	121 Liters
Tires: (9-Wheel) 5 Front, 4 Rear		7.50 x 15

WEIGHTS* 9-2800-PB

Body Capacity	137 cu. ft.	3.878 cu.m.
Empty Weight	8,390 lbs.	3,806 kgs.
GROSS WEIGHT		
w/Water	16,939 lbs.	7,683 kgs.
w/Sand (Dry)	22,090 lbs.	10,020 kgs.
w/Sand (Wet)	25,415 lbs.	11,528 kgs.

*WEIGHTS MAY VARY DUE TO OPTIONS SELECTED.



WEIGHTS* 9-3400-PB

Body Capacity	135 cu. ft.	3.822 cu.m.
Empty Weight	10,125 lbs.	4,593 kgs.
GROSS WEIGHT		
w/Water	18,549 lbs.	8,414 kgs.
w/Sand (Dry)	23,625 lbs.	10,716 kgs.
w/Sand (Wet)	27,000 lbs.	12,247 kgs.
w/Conc. Ballast	31,000 lbs.	14,062 kgs.

*WEIGHTS MAY VARY DUE TO OPTIONS SELECTED.

OPTIONAL EQUIPMENT

- Gas engine
- 10, 12 and 14 ply tires
- Sprinkler system with 75 gal. (284 liters) tank
- Back-up alarm
- Fog spray system with 75 gal. (284 liters) tank
- Extra 75 gal. (284 liters) tank
- Coco mats
- Nylon scrapers
- Covers for water ballast
- Covers for sand ballast
- Lights - 2 front, 2 rear
- Tail lights, 2 rear
- Rotating beacon
- Directional and hazard lights
- Fuel gauge
- Tachometer/hour meter
- ROPS w/seat belts

Bargraph engine monitoring system, w/tachometer, fuel gauge and low oil pressure, high water temperature and low voltage indicator.

COPY 2

SOLD TO
SOUTHWESTERN CONTRACTING
2720 STEMMONS FRWY. #305
DALLAS TX 75207

SOUTHWESTERN CONT. CO.
2720 STEMMONS FRWY. #305
DALLAS TX 75207

WEIGHT FOR STATE

DRIVER ON ☐ OFF ☐

207944

DATE	CUST. NO.	P.O. NO.	TRUCK NO.	TICKET NO.
8/12/88	6600	9645	RZA0972	207944

MAT. NO.	DESCRIPTION	CONTRACT NO.	PIT / PLANT
F0D0372	PNEUMATIC ROLLER		KLEBERG

UNIT PRICE .00	TIME 7:44
NET PRICE .00	LOAD NO. 1
TAX TOTAL .00	GROSS WT 37.99 tons1
GRAND TOTAL .00	TARE WT 28.06 tons1
	NET WT 9.93 tons
	JOB TOTAL 9.93 tons

LAURA

WEIGHMASTER

DRIVER

Brown & Root

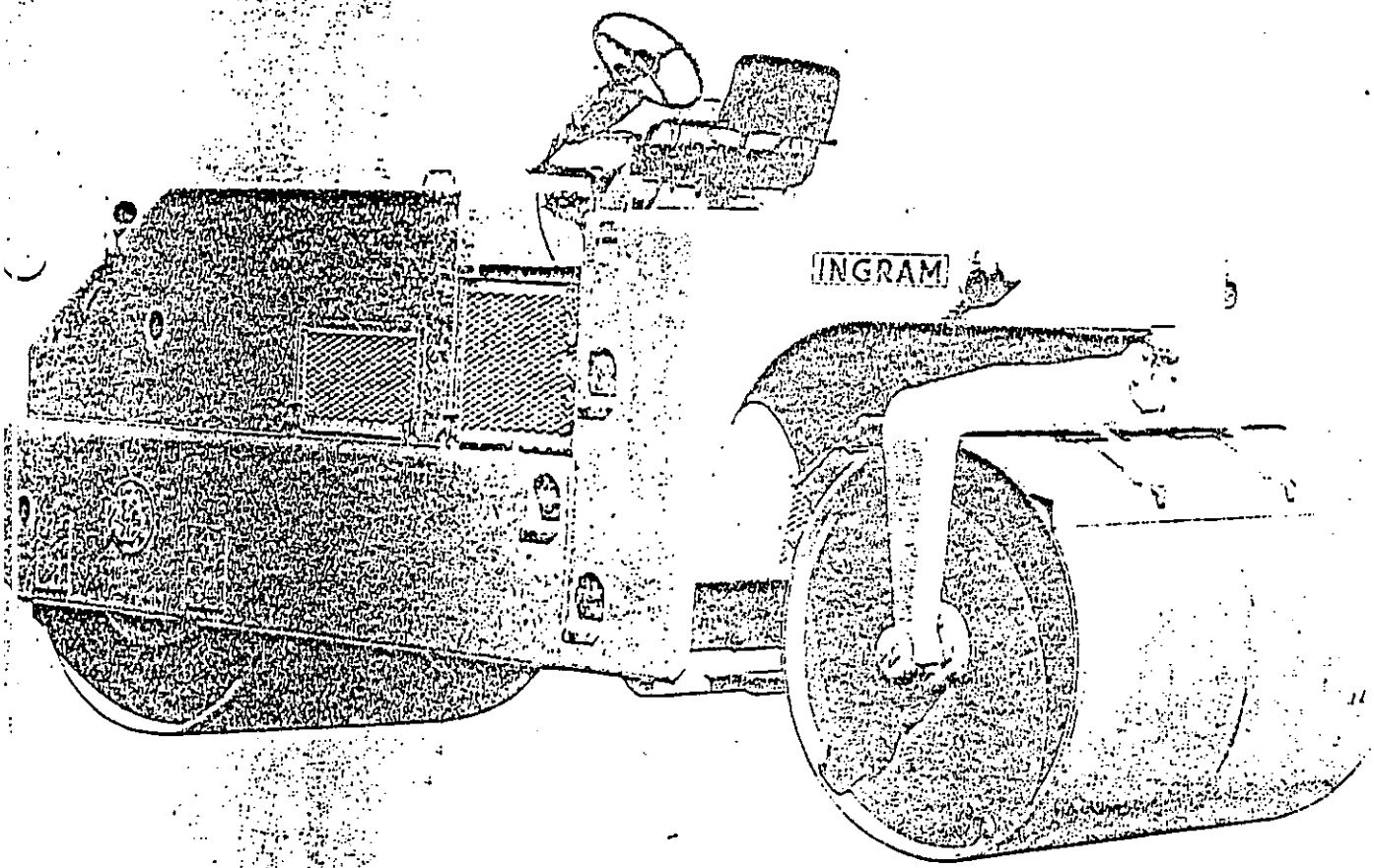
VIBRIN 8-12 TON

FINAL Rollers

~~12-4~~ 8,33

INGRAM® ROLLERS

"HB" SERIES TANDEM ROLLERS 8-12 AND 10-14 TON



QUALITY ROLLERS FOR OVER FIFTY YEARS

METAL WEIGHT	8-12 Ton lbs.	8-12 Ton kgs.	10-14 Ton lbs.	10-14 Ton kgs.
Gross weight	17,200	7,802	20,400	9,253
Drive roll	10,310	4,677	13,750	6,237
Steer roll	6,890	3,125	6,650	3,016

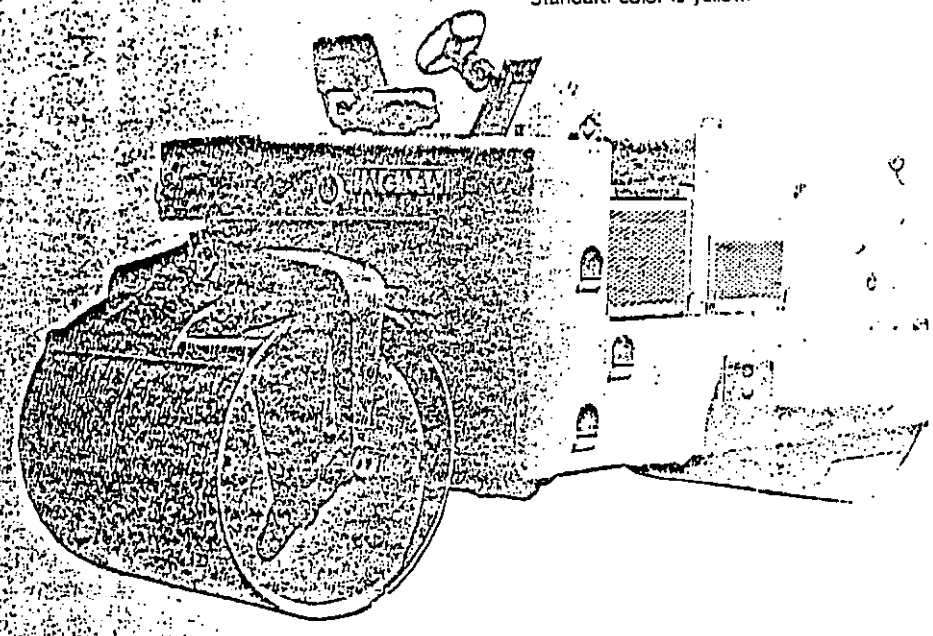
Compression	lbs/lin/in	kgs/lin/cm	lbs/lin/in	kgs/lin/cm
Drive roll	191	34.8	254	45.4
Steer roll	127	22.8	123	22.0

WATER BALLAST	8-12 Ton lbs.	8-12 Ton kgs.	10-14 Ton lbs.	10-14 Ton kgs.
Gross weight	24,200	10,977	28,100*	12,746
Drive roll	14,660	6,650	18,500	8,392
Steer roll	9,545	4,330	9,600	4,355

Compression	lbs/lin/in	kgs/lin/cm	lbs/lin/in	kgs/lin/cm
Drive roll	271	48.5	342	61.2
Steer roll	177	31.5	178	31.7

* With 50% capacity in fuel and water tanks.

Specifications are subject to change. Weight and dimensions are approximate. Standard color is yellow.



Printed in U.S.A. 385
I-12/10-14T-HB-3

Ingram Mfg. Co.
P.O. Box [illegible]
San Antonio, TX 78297
(512) [illegible]

[illegible] BHP @ 2400 RPM — 6 cylinder gas
Detroit Diesel 3-53N (4V)
*85 SAE BHP @ 2400 RPM — 3 cylinder diesel
12 volt electrical system, alternator, muffler and Donaldson Cyclopac 2 stage dry air cleaner with air filter condition indicator and dust ejector.

*SAE HP is intermittent at governed RPM. (not max. HP)

DIMENSIONS

Wheelbase	148"	3759MM
Overall Length	205"	5207MM
Overall Width	67"	1702MM
Rolling Width	54"	1372MM
Height	103"	2616MM
Ground Clearance	16"	406MM
Turning Radius (inside)	11'-7"	3530MM

CAPACITIES

Fuel Tank	32 Gal.	121 Liters
Sprinkler Tank	187 Gal.	708 Liters

ROLLS

Compression Roll		
Diameter	60"	1524MM
Width	54"	1372MM
Steering Roll		
Diameter	48"	1219MM
Width	54"	1372MM

Heavy steel tires 1 1/4" (28.5MM) on steering and compression roll. Outside diameter of rolls are machined concentric with the bearing bores. The steering rolls are made in two sections with tapered roller bearings. The compression roll is mounted on the planetary drive and a double row tapered roller outboard bearing.

HYDROSTATIC TRANSMISSION

The hydrostatic transmission is composed of a variable displacement piston pump and a fixed displacement piston motor. In this closed loop circuit, the fluid is filtered through a ten micron suction filter, with a filter condition indicator, and returned to the reservoir after passing through an oil to air heat exchanger.

PLANETARY FINAL DRIVE

A direct drive with the planetary gear case attaching to the compression roll and driven by the fixed displacement hydraulic motor.

Full power hydraulic steering provides fingertip control. The steering wheel mounted on the control servo unit provides sensory direction and delivery measurement within the same unit. This steering unit is non-load reacting. Road shocks at the steering roll are not transferred back to the steering wheel. The steering wheel may be pivoted to either side of the roller. Hydraulic cylinder is 3 1/2" (88.9MM) diameter.

SPEEDS

Infinitely variable speeds forward and reverse 0-8 MPH (0-12.9KM) speed, direction and braking are controlled by a single control lever.

BRAKES

Service braking is dynamic through the hydrostatic transmission. A fail-safe spring loaded brake mounted between the hydraulic motor and the planetary drive is activated if the engine or a pressure hose should fail. This system also provides a control that allows the fail-safe brake to be activated by the operator when the engine is running. Provision is made to release the fail-safe brake for emergency towing in the event of engine failure. An additional foot operated emergency hydraulic disc brake is mounted to the compression roll.

BEARINGS: ROLLS and KINGPIN

Tapered roller bearings are used on all rolls and the kingpin.

Diameter at bearing		
Drive roll axle	2.952"	74.9MM
Steering roll axle		
Outer	2.937"	74.6MM
Inner	3.000"	76.2MM
Kingpin		
Upper	5.000"	127.0MM
Lower	5.062"	128.6MM

SPRINKLER SYSTEM

The sprinkler tank has large clean out ports with bolt-on covers. Inside, the tank is sprayed with rust preventive. Individual controls adjust the flow of water to the galvanized spray bars.

The optional fog spray system is pressurized by an electric impeller pump with a filter in the pressure line. A filter in the sump filters the water before it enters the pump. Brass spray nozzles control the spray pattern.

QUALITY ROLLERS FOR OVER FIFTY YEARS

ORIGINAL

SOLD TO

DRIVER ON ☐ OFF ☐

10249

DATE	CUST. NO.	P.O. NO.	TRUCK NO.	TICKET NO.

MAT. NO.	DESCRIPTION	CONTRACT NO.	PIT / PLANT

UNIT PRICE	TIME 13:07
NET PRICE	LOAD NO.
TAX TOTAL	GROSS WT 8.33 tons
GRAND TOTAL	TARE WT 8.33 tons
	NET WT
	JOB TOTAL

WEIGHMASTER

DRIVER

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 5]

LAYER THICKNESS MEASUREMENTS (Inches)

SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
+						
0+00	0				2.6	
	36				2.2	
	72				1.6	
	108				1.6	
	144				1.2	
0+50	0				2.2	
	36				2.8	
	72				2.0	
	108				1.9	
	144				1.3	
1+00	0				2.5	
	36				2.8	
	72				2.4	
	108				2.4	
	144				1.9	
1+50	0				2.8	
	36				3.0	
	72				2.5	
	108				2.5	
	144				2.5	
2+00	0				2.6	
	36				3.1	
	72				2.4	
	108				2.3	
	144				2.4	
2+50	0				2.4	
	36				2.8	
	172				2.3	
	108				2.6	
	144				2.8	
LAYER NUMBER					6	

PREPARER [signature] EMPLOYER BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 5]

LAYER THICKNESS MEASUREMENTS (Inches)

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
3+00	0				2.4	
	36				2.4	
	72				2.0	
	108				1.8	
	144				2.0	
3+50	0				2.5	
	36				2.9	
	72				2.3	
	108				2.4	
	144				2.6	
4+00	0				2.3	
	36				2.3	
	72				1.9	
	108				2.2	
	144				2.5	
4+50	0				2.4	
	36				2.9	
	72				2.3	
	108				2.5	
	144				2.5	
5+00	0				2.3	
	36				2.3	
	72				1.8	
	108				2.3	
	144				2.6	
+						
+						
LAYER NUMBER					6	

MEAN 2.34
SD 0.39

PREPARER Barrone R. Robb BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA MISCELLANIOUS CONSTRUCTION NOTES AND COMMENTS CONSTRUCTION DATA SHEET 11	* STATE CODE [4 8] * SPS PROJECT CODE [A E] * TEST SECTION NO. [0 5]

Provide any miscellanious comments and notes concering construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indicatation of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

No "Surface Preparations" (Construction Data Sheets 3 & 4)
was applied to this section
No "Rut Level-up Treatment" (Construction Data Sheet 5)
was applied to this section.

Started paving virgin surface @ 0-124 of 48A504
Finished paving virgin surface @ 5+65 of 48A505
Began @ 1:30 and finished @ 5:30 (all on 10/21/91)
- included sections 4, 7, 6 & 5

PREPARER [signature] EMPLOYER BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA REVISED LAYER DESCRIPTIONS CONSTRUCTION DATA SHEET 2	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 6]

1. LAYER NUMBER	2. LAYER DESCRIPTION	3. MATERIAL TYPE CLASS	4. LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 1]				
2	[0 6]	[3 6]	[_ 10.0]	_ _ _._	_ _ _._	_ _ _._
3	[0 5]	[2 3]	[_ 11.0]	_ _ _._	_ _ _._	_ _ _._
4	[0 4]	[2 8]	[_ _ 7.5]	_ _ _._	_ _ _._	_ _ _._
5	[0 3]	[0 1]	[_ _ 0.0]	_ _ _._	_ _ _._	_ _ _._
6	[0 4]	[2 8]	[_ _ 2.2]	_ _ 1.6	_ _ 2.8	_ _ 0.3
7	[0 1]	[0 1]	[_ _ 2.3]	_ _ 1.8	_ _ 3.0	_ _ 0.3
8	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
11	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
12	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
13	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
14	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
15	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

NOTES:

1. Layer 1 is subgrade soil, the highest numbered layer is the pavement surface.
2. Layer description codes:

Overlay.....01	Base Layer.....05	Porous Friction Course..09
Seal/Tack Coat.....02	Subbase Layer.....06	Surface Treatment.....10
Original Surface.....03	Subgrade.....07	Embankment (Fill).....11
HMAC Layer (Subsurface).04	Interlayer.....08	

If milling was performed, the layers which were milled shall be assigned their previous layer number and material type. If the layer was completely removed by milling, it shall still be shown as a layer with a zero thickness.

3. Enter the material type classification codes from Tables A.5, A.6, A.7 and A.8 which best describes the material in each layer. If the layer was milled, enter the material classification code corresponding to the type material which was removed.
4. Enter the average thickness of each layer and the maximum, minimum, and standard deviation of the thickness measurements, if known. If a layer was partially milled, the remaining thickness of the layer shall be indicated.

PREPARER [signature] BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA PREPARATION OF MILLED TEST SECTIONS CONSTRUCTION DATA SHEET 6	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 6]

1. DATE OF MILLING OPERATION [07-29-91]

2. MANUFACTURER OF MILLING MACHINE (Specify) CATERPILLAR

3. MILLING MACHINE MODEL DESIGNATION (Specify) CM-8/PR-450

4. WIDTH OF CUTTING HEAD (Inches) [_ 7 5]

5. TOTAL MILLED DEPTH (Inches)

Location	No. Measrmnts	Maximum	Minimum	Std. Dev.	Average
Inside lane edge @ ℄	1 1.	_ 2.0	_ 1.4	_ 0.2	[1.7]
Outside lane edge @ SHOULDER	1 1.	_ 1.9	_ 1.3	_ 0.2	[1.8]

MILLED SURFACE CHARACTERISTICS

6. Macro Texture [2]
   Fine Macro Texture (≤¼ inch)... 1 Coarse Macro Texture(>¼ inch)... 2

7. Estimate of extent of test section surface area delaminated (Percent) [0 0]

8. Height of Ridge Between Parallel Passes? (Inches) [0.2]

9. Other Comments? (Yes, No) [YES]
   Comments SHOULDERS MILLED TO TAPER DOWN TO TRAVEL LANE (FOR DRAINAGE AND SAFETY)

10. WHERE PATCHES PLACED AFTER MILLING? (Yes, No) [No]
    (If yes complete Construction Data Sheet 3)

OPENED @ 5:30 7/29/91, PAVING BEGAN 10/16/91 1:30 PM

11. LENGTH OF TIME MILLED SURFACE WAS OPENED TO TRAFFIC? (Hrs.) [1892]
12. WAS MILL REPLACEMENT LAYER THICKER THAN MILL DEPTH (YES,NO) [YES]
13. LAYER NUMBER OF MILL REPLACEMENT [6]
14. NOMINAL THICKNESS OF MILL REPLACEMENT MATERIAL (Inches) [_ 2.2]

15. TYPE OF MILL REPLACEMENT LAYER MATERIAL [1]
    "Virgin" Asphalt Concrete ..... 1 Recycled Asphalt Concrete.... 2
    Other... 3 (Specify) _____

16. WAS ADJACENT TRAVEL LANE MILLED TO SAME DEPTH AS TEST LANE? (Yes, No) [YES]
    IF NO, WIDTH MILLED SAME DEPTH AS TEST LANE (Feet) [_ _ . _]

17. COMMENTS

1ST PASS = - FROM CENTERLINE TO CENTER OF OUTSIDE LANE
- STARTED @ 0- . OF 48A507, FINISHED @ 6+36 OF 48A506
- STARTED @ 1:30, FINISHED @ 2:30

2ND PASS = - FROM CENTER OF OUTSIDE LANE TO SHOULDER STRIPE
- STARTED @ 0- OF 48A507, FINISHED @ 6+36 OF 48A506
- STARTED @ 2:45, FINISHED @ 3:30

PREPARER [signature] EMPLOYER BRE DATE 8/2/91

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 8	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 6]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [1 0-2 1-9 1]
2. DATE PAVING OPERATIONS COMPLETED [1 0-2 1-9 1]
3. LAYER NUMBER [7]
4. MIXING TEMPERATURE (°F) [_ _ _.]
5. LAYDOWN TEMPERATURES (°F)
   Mean..... 3 3 0.
   Minimum..... _ _ _.
   Standard Deviation... _ _.
   Number of Tests ..... _ _.
   Maximum..... _ _ _.

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH W&ASCE)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Wal Tandem	8.3				
7	B	Steel-Wal Tandem	_ _._				
8	C	Steel-Wal Tandem	_ _._				
9	D	Steel-Wal Tandem	_ _..				
10	E	Pneumatic-Tired	9.9	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._	.			
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	._ _ _	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	._ _ _	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	._ _ _	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	._ _ _	_ _._
18	M	Double-Drum Vibr.	7.8		_ _ _ _.	._ _ _	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	._ _ _	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	._ _ _	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	._ _ _	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	_	_	_
24	Coverages	_ 3.	_ _.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	_	_	_
26	Coverages	_ 6	_ _.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	_	_	_
28	Coverages	_ 2	_ _.	_ _.	_ _.
29	Air Temperature (°F)	_ 8 0.	_ _ _.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	2.3	_._	_._	_._
31	Curing Period (Days)	_ 0.1	_ _._	_ _._	_ _._

PREPARER [signature] BRE DATE _____

LTPP-SPS CONSTRUCTION DATA OVERLAY PLACEMENT OPERATIONS CONSTRUCTION DATA SHEET 7	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 6]

1. DATE SURFACE PREPARATION BEGAN (Month-Day-Year) [1 0-1 6-9 1]
2. DATE SURFACE PREPARATION COMPLETED [1 0-1 6-9 1]

3. SURFACE PREPARATION PRIOR TO PLACEMENT OF OVERLAY [3]
   None..... 1 Broomed..... 2 Broomed + Asphaltic Tack Coat.... 3
   Asphaltic Tack Coat (only).... 4

4. TACK COAT
   Layer Numbers [_ _] [1 0]
   Material Type None..... 1 SS-1.... 2 SS-1H.... 3 CRS-1.... 4 [_ _]
   CRS-2.... 5 CMS-2.... 6 CMS-2H.. 7 CSS-1.... 8 CSS-1H... 9
   Other.... 10 (Specify) RC-250
5. TACK COAT DILUTION
   (Percent) [_ _]
   Mixing Rate Parts Diluent ___ TO Parts Asphalt ___
6. TACK COAT APPLICATION RATE (Gal/Sq. Yd.) [0.0 2]

7. ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers
Plant 1	[2]	AZTEC, SUPER SIX PACK	[1 9]	[2 5]	[6] [7] [_]
Plant 2	[_]		[_ _]	[_ _]	[_] [_] [_]
Plant 3	[_]		[_ _]	[_ _]	[_] [_] [_]

   Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify ___

8. MANUFACTURER OF ASPHALT CONCRETE PAVER BARBER GREENE
9. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER SB-140
10. SINGLE PASS LAYDOWN WIDTH (Feet) SURFACE [1 2.5]
11. AC BINDER COURSE LIFT
    Layer Number [_ _]
    Nominal First Lift Placement Thickness (Inches) [_ _._]
    Nominal Second Lift Placement Thickness (Inches) [_ _._]
12. AC SURFACE COURSE LIFT
    Layer Number [0 7]
    Nominal First Lift Placement Thickness (Inches) [2.3]
    Nominal Second Lift Placement Thickness (Inches) [_ _._]
13. SURFACE FRICTION COURSE
    Layer Number [_ _]
    Nominal Placement Thickness (Inches) [_ _._]
14. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
    Binder Course [_ + _ _]
    Surface Course [_ + _ _]
    Surface Friction Course [_ + _ _]
15. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2 (specify offset from O/S feet) [_ _._]

16. SIGNIFICANT EVENTS DURING CONSTRUCTION(disruptions, rain, equip. problems, etc.)

PREPARER [signature] BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 3	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 6]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [1 0-1 6-9 1]
2. DATE PAVING OPERATIONS COMPLETED [1 0-1 6-9 1]

3. LAYER NUMBER [6]

4. MIXING TEMPERATURE (°F) [_ _ _.]

5. LAYDOWN TEMPERATURES (°F)
   Mean..... 3 3 0.
   Minimum..... _ _ _.
   Standard Deviation... _ _.
   Number of Tests ..... _ _
   Maximum..... _ _ _

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH 48A505)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	8.3				
7	B	Steel-Whl Tandem	_ _._				
8	C	Steel-Whl Tandem	_ _._				
9	D	Steel-Whl Tandem	_ _._				
10	E	Pneumatic-Tired	9.9	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._				
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
18	M	Double-Drum Vibr.	7.8		_ _ _ _.	_ _ _	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	_	_	_
24	Coverages	3.	_ _.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	_	_	_
26	Coverages	6.	_ _.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	_	_	_
28	Coverages	2.	_ _.	_ _.	_ _.
29	Air Temperature (°F)	80.	_ _ _.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	2.2	_._	_._	_._
31	Curing Period (Days)	0.1	_ _._	_ _._	_ _._

PREPARER [signature] BZ DATE _____

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 6]

LAYER THICKNESS MEASUREMENTS (Inches)

SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
+						
0+00	0		2.0		2.3	
	36		2.2		2.3	
	72		2.3		2.3	
	108		2.0		2.4	
	144		2.0		2.8	
0+50	0		1.7		3.0	
	36		2.3		2.6	
	72		2.3		2.4	
	108		2.2		2.3	
	144		2.2		2.2	
1+00	0		1.9		2.4	
	36		2.5		1.9	
	72		2.5		1.9	
	108		2.6		1.9	
	144		2.4		2.0	
1+50	0		1.8		2.8	
	36		2.2		2.6	
	72		2.4		2.4	
	108		2.3		2.4	
	144		2.3		2.4	
2+00	0		2.2		2.8	
	36		2.3		2.6	
	72		2.5		2.4	
	108		2.3		2.4	
	144		2.2		2.5	
2+50	0		2.2		2.2	
	36		2.4		2.3	
	72		2.4		2.0	
	108		2.3		2.3	
	144		2.3		2.3	
LAYER NUMBER			6		7	

PREPARER [signature] BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 6]

LAYER THICKNESS MEASUREMENTS (Inches)

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
3+00	0		2.3		2.3	
	36		2.3		2.4	
	72		2.3		2.3	
	108		2.3		2.0	
	144		2.4		2.4	
3+50	0		2.4		2.3	
	36		2.4		2.3	
	72		2.3		2.2	
	108		2.2		2.2	
	144		2.2		2.2	
4+00	0		1.9		2.4	
	36		2.0		2.5	
	72		2.0		2.3	
	108		2.0		2.3	
	144		2.5		2.0	
4+50	0		2.2		2.6	
	36		2.6		2.2	
	72		2.6		2.0	
	108		2.8		1.8	
	144		2.8		1.8	
5+00	0		1.6		2.5	
	36		1.8		2.4	
	72		1.8		2.2	
	108		1.7		2.0	
	144		1.9		1.9	
+						
+						
LAYER NUMBER			6		7	
		MEAN	2.23		2.30	
		SD.	0.26		0.26	

PREPARER [signature] BRS DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA MISCELLANIOUS CONSTRUCTION NOTES AND COMMENTS CONSTRUCTION DATA SHEET 11	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 6]

Provide any miscellanious comments and notes concering construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indicatection of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

No "Surface Preparation" (Construction Data Sheet 3 & 4) was applied to this section

See Data Sheet 6 for details of milling

Started paving virgin mill replacement @ 0-45 of 48A507
Finished paving virgin mill replacement @ 5+145 of 48A506
Began @ and finished @ (all on 10/16/91)
— included sections 7 & 6

Started paving virgin surface @ 0-124 of 48A504
Finished paving virgin surface @ 5+65 of 48A505
Began @ 1:30 and finished @ 5:30 (all on 10/21/91)
— included sections 4, 7, 6 & 5

PREPARER J Bronert-Dahl BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA REVISED LAYER DESCRIPTIONS CONSTRUCTION DATA SHEET 2	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 7]

1. LAYER NUMBER	2. LAYER DESCRIPTION	3. MATERIAL TYPE CLASS	4. LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 1]				
2	[0 6]	[3 6]	[10.0]	---.-	---.-	---.-
3	[0 5]	[2 3]	[11.0]	---.-	---.-	---.-
4	[0 4]	[2 8]	[7.5]	---.-	---.-	---.-
5	[0 3]	[0 1]	[0.0]	---.-	---.-	---.-
6	[0 4]	[2 8]	[4.7]	4.1	5.5	0.3
7	[0 1]	[0 1]	[2.2]	1.7	2.6	0.2
8	[ ]	[ ]	[---.-]	---.-	---.-	---.-
9	[ ]	[ ]	[---.-]	---.-	---.-	---.-
10	[ ]	[ ]	[---.-]	---.-	---.-	---.-
11	[ ]	[ ]	[---.-]	---.-	---.-	---.-
12	[ ]	[ ]	[---.-]	---.-	---.-	---.-
13	[ ]	[ ]	[---.-]	---.-	---.-	---.-
14	[ ]	[ ]	[---.-]	---.-	---.-	---.-
15	[ ]	[ ]	[---.-]	---.-	---.-	---.-

NOTES:

1. Layer 1 is subgrade soil, the highest numbered layer is the pavement surface.
2. Layer description codes:
   Overlay.....01 Base Layer.....05 Porous Friction Course..09
   Seal/Tack Coat.....02 Subbase Layer.....06 Surface Treatment.....10
   Original Surface.....03 Subgrade.....07 Embankment (Fill).....11
   HMAC Layer (Subsurface).04 Interlayer.....08
   If milling was performed, the layers which were milled shall be assigned their previous layer number and material type. If the layer was completely removed by milling, it shall still be shown as a layer with a zero thickness.
3. Enter the material type classification codes from Tables A.5, A.6, A.7 and A.8 which best describes the material in each layer. If the layer was milled, enter the material classification code corresponding to the type material which was removed.
4. Enter the average thickness of each layer and the maximum, minimum, and standard deviation of the thickness measurements, if known. If a layer was partially milled, the remaining thickness of the layer shall be indicated.

PREPARER Jerome R. Dell EMPLOYER BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA PREPARATION OF MILLED TEST SECTIONS CONSTRUCTION DATA SHEET 6	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 7]

1. DATE OF MILLING OPERATION [07-29-91]

2. MANUFACTURER OF MILLING MACHINE (Specify) CATERPILLAR

3. MILLING MACHINE MODEL DESIGNATION (Specify) CM-8 / PR-450

4. WIDTH OF CUTTING HEAD (Inches) [_ 7 5]

5. TOTAL MILLED DEPTH (Inches)

Location	No. Measrmnts	Maximum	Minimum	Std. Dev.	Average
Inside lane edge @ ℄	11.	2.4	1.4	0.3	1.8
Outside lane edge @ SHOULDER	11.	2.8	1.6	0.3	1.8

MILLED SURFACE CHARACTERISTICS

6. Macro Texture [2]
   Fine Macro Texture (≤¼ inch)... 1 Coarse Macro Texture(>¼ inch)... 2

7. Estimate of extent of test section surface area delaminated (Percent) [0 0]

8. Height of Ridge Between Parallel Passes? (Inches) [0.2]

9. Other Comments? (Yes, No) [YES]
   Comments SHOULDERS MILLED TO TAPER DOWN TO TRAVEL LANE (FOR DRAINAGE AND SAFETY)

10. WHERE PATCHES PLACED AFTER MILLING? (Yes, No) [No]
    (If yes complete Construction Data Sheet 3)

OPENNED @ 5:30 7/29/91, PAVING BEGAN 10/16/91 12:00 AM

11. LENGTH OF TIME MILLED SURFACE WAS OPENED TO TRAFFIC? (Hrs.) [1 8 9 0.5]
12. WAS MILL REPLACEMENT LAYER THICKER THAN MILL DEPTH (YES,NO) [YES]
13. LAYER NUMBER OF MILL REPLACEMENT [6]
14. NOMINAL THICKNESS OF MILL REPLACEMENT MATERIAL (Inches) [_ 2.2]

15. TYPE OF MILL REPLACEMENT LAYER MATERIAL [1]
    "Virgin" Asphalt Concrete ..... 1 Recycled Asphalt Concrete.... 2
    Other... 3 (Specify)

16. WAS ADJACENT TRAVEL LANE MILLED TO SAME DEPTH AS TEST LANE? (Yes, No) [YES]
    IF NO, WIDTH MILLED SAME DEPTH AS TEST LANE (Feet) [_ _ . _]

17. COMMENTS

1ST PASS: - FROM CENTERLINE TO CENTER OF OUTSIDE LANE
- STARTED @ 0- . OF 48A507, FINISHED @ 6+36 OF 48A506
- STARTED @ 1:30, FINISHED @ 2:30

2ND PASS: - FROM CENTER OF OUTSIDE LANE TO SHOULDER STRIPE
- STARTED @ 0- OF 48A507, FINISHED @ 6+36 OF 48A506
- STARTED @ 2:45, FINISHED @ 3:30

PREPARER [signature] EMPLOYER BRE DATE 8/2/91

LTPP-SPS CONSTRUCTION DATA OVERLAY PLACEMENT OPERATIONS CONSTRUCTION DATA SHEET 7	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 7]

1. DATE SURFACE PREPARATION BEGAN (Month-Day-Year) [1 0-1 6-9 1]
2. DATE SURFACE PREPARATION COMPLETED [1 0-1 6-9 1]

3. SURFACE PREPARATION PRIOR TO PLACEMENT OF OVERLAY [3]
   None..... 1 Broomed..... 2 Broomed + Asphaltic Tack Coat.... 3
   Asphaltic Tack Coat (only).... 4

4. TACK COAT
   Layer Numbers [_ _] [1 0]
   Material Type None..... 1 SS-1.... 2 SS-1H.... 3 CRS-1.... 4 [_ _]
   CRS-2.... 5 CMS-2.... 6 CMS-2H.. 7 CSS-1.... 8 CSS-1H... 9
   Other.... 10 (Specify) RC-250
5. TACK COAT DILUTION
   (Percent) [_ _]
   Mixing Rate Parts Diluent ___ TO Parts Asphalt ___
6. TACK COAT APPLICATION RATE (Gal/Sq. Yd.) [0.0 2]

7. ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers
Plant 1	[2]	AZTEC, SUPER SIX PACK	[1 9]	[2 5]	[6] [7] [_]
Plant 2	[_]		[_ _]	[_ _]	[_] [_] [_]
Plant 3	[_]		[_ _]	[_ _]	[_] [_] [_]

   Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify_____

8. MANUFACTURER OF ASPHALT CONCRETE PAVER BARBER GREENE
9. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER SB-140
10. SINGLE PASS LAYDOWN WIDTH (Feet) [1 2.5]
    1ST LIFT 12.5
    2ND LIFT 13.0
    SURFACE 12.5
11. AC BINDER COURSE LIFT
    Layer Number [0 6]
    Nominal First Lift Placement Thickness (Inches) [1.5]
    Nominal Second Lift Placement Thickness (Inches) [1.0]
12. AC SURFACE COURSE LIFT
    Layer Number [0 7]
    Nominal First Lift Placement Thickness (Inches) [2.2]
    Nominal Second Lift Placement Thickness (Inches) ~~[_ _]~~
13. SURFACE FRICTION COURSE
    Layer Number ~~[_ _]~~
    Nominal Placement Thickness (Inches) ~~[_.__]~~
14. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
    Binder Course ~~[_ _ + _ _]~~
    Surface Course ~~[_ _ + _ _]~~
    Surface Friction Course ~~[_ _ + _ _]~~
15. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2 (specify offset from O/S feet) ~~[_ _.__]~~

16. SIGNIFICANT EVENTS DURING CONSTRUCTION(disruptions, rain, equip. problems, etc.)

PREPARER [signature] EMPLOYER BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 8	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 7]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [1 0-2 1-9 1]
2. DATE PAVING OPERATIONS COMPLETED [1 0-2 1-9 1]

3. LAYER NUMBER [7]

4. MIXING TEMPERATURE (°F) [_ _ _.]

5. LAYDOWN TEMPERATURES (°F)
   Mean..... 3 3 0. Number of Tests ..... _ _.
   Minimum..... _ _ _. Maximum..... _ _ _.
   Standard Deviation... _ _.

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH 48A505

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	8.3				
7	B	Steel-Whl Tandem	_ _._				
8	C	Steel-Whl Tandem	_ _._				
9	D	Steel-Whl Tandem	_ _._				
10	E	Pneumatic-Tired	9.9	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._				
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
18	M	Double-Drum Vibr.	7.8		_ _ _ _.	_ _ _	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	_	_	_
24	Coverages	_ 3.	_ _.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	_	_	_
26	Coverages	_ 6.	_ _.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	_	_	_
28	Coverages	_ 2.	_ _.	_ _.	_ _.
29	Air Temperature (°F)	_ 8 0.	_ _ _.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	2.2	_._	_._	_._
31	Curing Period (Days)	_ 0.1	_ _._	_ _._	_ _._

PREPARER [signature] EMPLOYER BRE DATE _____

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 8	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 7]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [1 0-1 6-9 1]
2. DATE PAVING OPERATIONS COMPLETED [1 0-1 8-9 1]

3. LAYER NUMBER [6]

4. MIXING TEMPERATURE (°F) [_ _ _.]

5. LAYDOWN TEMPERATURES (°F)
   Mean..... 3 3 0. Number of Tests ..... _ _
   Minimum..... _ _ _. Maximum..... _ _ _.
   Standard Deviation... _ _.

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH 48A505)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	8.3				
7	B	Steel-Whl Tandem	_ _._				
8	C	Steel-Whl Tandem	_ _._				
9	D	Steel-Whl Tandem	_ _._				
10	E	Pneumatic-Tired	9.9	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._	_ _ _ _.			
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
18	M	Double-Drum Vibr.	7.4		_ _ _ _.	_ _ _	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	M	M	_
24	Coverages	3.	3.	3.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	E	E	_
26	Coverages	6.	6.	6.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	A	A	_
28	Coverages	2.	2.	2.	_ _.
29	Air Temperature (°F)	80.	80.	85.	_ _ _.
30	Compacted Thickness (In)	2.2	1.5	1.0	_._
31	Curing Period (Days)	0.1	0.1	0.1	_ _._

PREPARER [signature] EMPLOYER BRE DATE _____

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 7]

LAYER THICKNESS MEASUREMENTS (Inches)

SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
+						
0+00	0			2.1	2.4	1.7
	36			2.4 ~~2.4~~	2.1	1.8
	72			1.9 ~~2.9~~	2.3	2.2
	108			2.1	2.4	2.0
	144			2.4 ~~2.4~~	2.6	1.9
0+50	0			1.9	2.7	2.0
	36			2.2	2.6	2.0
	72			2.0	2.6	2.2
	108			2.1	2.7	2.3
	144			2.1	2.8	2.2
1+00	0			2.1	2.3	2.0
	36			2.1	2.4	2.0
	72			1.9	2.6	2.0
	108			2.0	2.4	2.0
	144			1.9	2.4	1.9
1+50	0			2.2	2.4	2.3
	36			2.2	2.7	2.2
	72			2.0	2.8	2.2
	108			2.2	2.8	2.0
	144			2.2	2.9	1.7
2+00	0			2.2	2.4	2.0
	36			2.2	2.6	2.2
	72			2.2	2.6	2.2
	108			2.0	2.6	2.4
	144			2.4	2.7	2.3
2+50	0			1.5	2.9	2.4
	36			2.1	2.7	2.3
	72			2.0	2.6	2.3
	108			1.8	2.6	2.3
	144			2.4	2.7	2.0
LAYER NUMBER				6	6	7

PREPARER Bruce T. Dallas EMPLOYER BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 7]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
3+00	0		2.2	2.6	2.4	
	36		2.4	2.4	2.4	
	72		2.1	2.4	2.4	
	108		2.1	2.4	2.4	
	144		2.7	2.7	2.0	
3+50	0		2.2	2.3	2.3	
	36		2.2	2.3	2.3	
	72		2.1	2.3	2.4	
	108		2.0	2.1	2.6	
	144		2.2	2.3	2.4	
4+00	0		2.2	2.7	2.2	
	36		2.4	2.6	2.3	
	72		2.1	2.3	2.4	
	108		2.1	2.3	2.3	
	144		2.4	2.2	2.3	
4+50	0		2.0	2.3	2.6	
	36		2.5	2.4	2.5	
	72		2.0	2.4	2.6	
	108		1.8	2.4	2.6	
	144		2.4	2.6	2.4	
5+00	0		3.0	2.6	2.0	
	36		2.6	2.4	1.9	
	72		2.5	2.6	2.0	
	108		2.5	2.3	2.2	
	144		2.6	2.6	1.9	
+						
+						
LAYER NUMBER			6	6	7	
	MEAN		~~2.5~~ 2.18	2.51	2.20	
	SD		0.25	0.19	0.23	

PREPARER Bernie C. Dahl EMPLOYER BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA MISCELLANIOUS CONSTRUCTION NOTES AND COMMENTS CONSTRUCTION DATA SHEET 11	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 7]

Provide any miscellanious comments and notes concering construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indicatation of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

NO "SURFACE PREPARATION" (CONSTRUCTION DATA SHEETS 3 & 4)
WAS APPLIED TO THIS SECTION
SEE DATA SHEET 6 FOR DETAILS OF MILLING

STARTED PAVING VIRGIN MILL REPLACEMENT @ 0-45 OF 48A507
FINISHED PAVING VIRGIN MILL REPLACEMENT @ 5+145 OF 48A506
BEGAN @ AND FINISHED @ (ALL ON 10/16/91)
- INCLUDED SECTIONS 7 & 6

STARTED PAVING 1ST LIFT OF VIRGIN BINDER @ 0-64 OF 48A504
FINISHED PAVING 1ST LIFT OF VIRGIN BINDER @ 5+122 OF 48A507
BEGAN @ 1:00 AND FINISHED @ 3:30 (ALL ON 10/17/91)
- INCLUDED SECTIONS 4 & 7

STARTED PAVING 2ND LIFT OF VIRGIN BINDER @ 0-84 OF 48A504
FINISHED PAVING 2ND LIFT OF VIRGIN BINDER @ 5+148 OF 48A507
BEGAN @ 2:30 AND FINISHED @ 5:00 (ALL ON 10/18/91)
- INCLUDED SECTIONS 4 & 7

PREPARER [signature] EMPLOYER BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA MISCELLANIOUS CONSTRUCTION NOTES AND COMMENTS CONSTRUCTION DATA SHEET 11	* STATE CODE [4 3] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 7]

PAGE 2 OF 2

Provide any miscellanious comments and notes concering construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indicatation of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

STARTED PAVING VIRGIN SURFACE @ 0 - 124 OF 48A504

FINISHED PAVING VIRGIN SURFACE @ 5+ 65 OF 48A505

BEGAN @ 1:30 AND FINISHED @ 5:30 (ALL ON 10/21/91)

- INCLUDED SECTIONS 4, 7, 6 & 5

PREPARER Jerome F. Dahl EMPLOYER BRE DATE 10/30/91

LTPP-SPS CONSTRUCTION DATA REVISED LAYER DESCRIPTIONS CONSTRUCTION DATA SHEET 2	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 8]

1. LAYER NUMBER	2. LAYER DESCRIPTION	3. MATERIAL TYPE CLASS	4. LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 1]				
2	[0 6]	[3 6]	[10.0]	---.-	---.-	---.-
3	[0 5]	[2 3]	[11.0]	---.-	---.-	---.-
4	[0 4]	[2 8]	[7.5]	---.-	---.-	---.-
5	[0 3]	[0 1]	[0.0]	---.-	---.-	---.-
6	[0 4]	[3 4]	[4.7]	4.0	5.3	0.3
7	[0 1]	[1 3]	[1.9]	1.6	2.3	0.2
8	[ ]	[ ]	[ ]	---.-	---.-	---.-
9	[ ]	[ ]	[ ]	---.-	---.-	---.-
10	[ ]	[ ]	[ ]	---.-	---.-	---.-
11	[ ]	[ ]	[ ]	---.-	---.-	---.-
12	[ ]	[ ]	[ ]	---.-	---.-	---.-
13	[ ]	[ ]	[ ]	---.-	---.-	---.-
14	[ ]	[ ]	[ ]	---.-	---.-	---.-
15	[ ]	[ ]	[ ]	---.-	---.-	---.-

NOTES:

1. Layer 1 is subgrade soil, the highest numbered layer is the pavement surface.
2. Layer description codes:

Overlay.....01	Base Layer.....05	Porous Friction Course..09
Seal/Tack Coat.....02	Subbase Layer.....06	Surface Treatment.....10
Original Surface.....03	Subgrade.....07	Embankment (Fill).....11
HMAC Layer (Subsurface).04	Interlayer.....08	

If milling was performed, the layers which were milled shall be assigned their previous layer number and material type. If the layer was completely removed by milling, it shall still be shown as a layer with a zero thickness.

3. Enter the material type classification codes from Tables A.5, A.6, A.7 and A.8 which best describes the material in each layer. If the layer was milled, enter the material classification code corresponding to the type material which was removed.
4. Enter the average thickness of each layer and the maximum, minimum, and standard deviation of the thickness measurements, if known. If a layer was partially milled, the remaining thickness of the layer shall be indicated.

PREPARER [signature] BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA PREPARATION OF MILLED TEST SECTIONS CONSTRUCTION DATA SHEET 6	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 8]

1. DATE OF MILLING OPERATION [07-25-91]

2. MANUFACTURER OF MILLING MACHINE (Specify) CATERPILLAR

3. MILLING MACHINE MODEL DESIGNATION (Specify) CM-8/PR-450

4. WIDTH OF CUTTING HEAD (Inches) [_ 7 5]

5. TOTAL MILLED DEPTH (Inches)

Location	No. Measrmnts	Maximum	Minimum	Std. Dev.	Average
Inside lane edge @ ℄	11.	1.8	1.0	0.2	1.4
Outside lane edge @ SHOULDER	11.	1.7	1.3	0.1	1.5

MILLED SURFACE CHARACTERISTICS

6. Macro Texture [2]
   Fine Macro Texture (≤¼ inch)... 1 Coarse Macro Texture(>¼ inch)... 2

7. Estimate of extent of test section surface area delaminated (Percent) [0 0]

8. Height of Ridge Between Parallel Passes? (Inches) [0.1]

9. Other Comments? (Yes, No) [YES]
   Comments SHOULDERS MILLED TO TAPER DOWN TO TRAVEL LANE (FOR DRAINAGE AND SAFETY)

10. WHERE PATCHES PLACED AFTER MILLING? (Yes, No) [No]
    (If yes complete Construction Data Sheet 3)
    OPENNED 1:00 PM 7/25/91, PAVING BEGAN 2:00 PM 9/26/-
11. LENGTH OF TIME MILLED SURFACE WAS OPENED TO TRAFFIC? (Hrs.) 5 DAYS 25 HOURS [3 6 9]
12. WAS MILL REPLACEMENT LAYER THICKER THAN MILL DEPTH (YES,NO) [YES]
13. LAYER NUMBER OF MILL REPLACEMENT [6]
14. NOMINAL THICKNESS OF MILL REPLACEMENT MATERIAL (Inches) [_ 2.0]

15. TYPE OF MILL REPLACEMENT LAYER MATERIAL [2]
    "Virgin" Asphalt Concrete ..... 1 Recycled Asphalt Concrete.... 2
    Other... 3 (Specify)

16. WAS ADJACENT TRAVEL LANE MILLED TO SAME DEPTH AS TEST LANE? (Yes, No) [YES]
    IF NO, WIDTH MILLED SAME DEPTH AS TEST LANE (Feet) [_ _ . _]

17. COMMENTS
    1st Pass: - FROM SHOULDER STRIPE TO CENTER OF LANE
    - STARTED @ 0-50. OF 48A509, FINISHED @ 6+54 OF 48A508
    - STARTED @ 8:45, FINISHED @ 10:00

    2nd Pass: - FROM CENTER OF LANE TO CENTERLINE STRIPE
    - STARTED @ 0-50 OF 48A509, FINISHED @ 6+54 OF 48A508
    - STARTED @ 10:15, FINISHED @ 11:15

PREPARER Jerome C. Dill EMPLOYER BRE DATE 7/25/91
9/23/91

LTPP-SPS CONSTRUCTION DATA OVERLAY PLACEMENT OPERATIONS CONSTRUCTION DATA SHEET 7	* STATE CODE [4 0] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 2]

1. DATE SURFACE PREPARATION BEGAN (Month-Day-Year) [0 9-2 0-9 1]
2. DATE SURFACE PREPARATION COMPLETED [0 9-2 0-9 1]

3. SURFACE PREPARATION PRIOR TO PLACEMENT OF OVERLAY [3]
   None..... 1 Broomed..... 2 Broomed + Asphaltic Tack Coat.... 3
   Asphaltic Tack Coat (only).... 4

4. TACK COAT
   Layer Numbers [_ _] [1 0]
   Material Type None..... 1 SS-1.... 2 SS-1H.... 3 CRS-1.... 4 [_ _]
   CRS-2.... 5 CMS-2.... 6 CMS-2H.. 7 CSS-1.... 8 CSS-1H... 9
   Other.... 10 (Specify) RC-250
5. TACK COAT DILUTION
   (Percent) [_ _]
   Mixing Rate Parts Diluent ___ TO Parts Asphalt ___
6. TACK COAT APPLICATION RATE (Gal/Sq. Yd.) [0.0 2]

7. ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers
Plant 1	[2]	AZTEC, SUPER SIX PACK	[1 9]	[2 5]	[6] [7] [_]
Plant 2	[_]		[_ _ _]	[_ _]	[_] [_] [_]
Plant 3	[_]		[_ _ _]	[_ _]	[_] [_] [_]

   Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify

8. MANUFACTURER OF ASPHALT CONCRETE PAVER BARBER GREENE
9. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER BG-260
10. SINGLE PASS LAYDOWN WIDTH (Feet) 11.6 1ST LIFT, 12.0 2ND LIFT, 12.5 SURFACE [1 2.5]
11. AC BINDER COURSE LIFT
    Layer Number [0 6]
    Nominal First Lift Placement Thickness (Inches) [1.4]
    Nominal Second Lift Placement Thickness (Inches) [1.3]
12. AC SURFACE COURSE LIFT
    Layer Number [0 7]
    Nominal First Lift Placement Thickness (Inches) [1.9]
    Nominal Second Lift Placement Thickness (Inches) ~~[_ _]~~
13. SURFACE FRICTION COURSE
    Layer Number ~~[_ _]~~
    Nominal Placement Thickness (Inches) ~~[_ _]~~
14. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
    Binder Course ~~[_ + _ _]~~
    Surface Course ~~[_ + _ _]~~
    Surface Friction Course ~~[_ + _ _]~~
15. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2 (specify offset from O/S feet) ~~[_ _ _]~~

16. SIGNIFICANT EVENTS DURING CONSTRUCTION(disruptions, rain, equip. problems, etc.)
    2" MILL REPLACEMENT 9/20/91, RAIN 9/23/91 (NO PAVING DONE), RAINED 9/24/91 (WHILE PAVING INSIDE SHOULDER)

PREPARER [signature] EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 3	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 8]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9 - 2 0 - 9 1]
2. DATE PAVING OPERATIONS COMPLETED [0 9 - 2 5 - 9 1]
3. LAYER NUMBER [6]
4. MIXING TEMPERATURE (°F) [_ _ _.]
5. LAYDOWN TEMPERATURES (°F)
   Mean..... 2 9 3.
   Minimum..... _ _ _.
   Standard Deviation... _ _.
   Number of Tests ..... _ _.
   Maximum..... _ _ _.

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH WBASOC)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	1 0.1				
7	B	Steel-Whl Tandem	_ _._				
8	C	Steel-Whl Tandem	_ _._				
9	D	Steel-Whl Tandem	_ _._				
10	E	Pneumatic-Tired	1 2.4	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._				
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
18	M	Double-Drum Vibr.	1 0.1		_ _ _ _.	_ _ _	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	M	M	_
24	Coverages	_ 3.	_ 3.	_ 3.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	E	E	_
26	Coverages	_ 6.	_ 6.	_ 6.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	A	A	_
28	Coverages	_ 2.	_ 2.	_ 2.	_ _.
29	Air Temperature (°F)	_ 6 0.	_ 8 0.	_ 7 5.	_ _ _.
30	Compacted Thickness (In)	2.0	1.4	1.3	_._
31	Curing Period (Days)	_ 0.1	_ 0.1	_ 0.1	_ _._

PREPARER [signature] EMPLOYER BRC DATE _____

October 1990

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 8	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 8]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9 - 2 6 - 9 1]
2. DATE PAVING OPERATIONS COMPLETED [0 9 - 2 6 - 9 1]

3. LAYER NUMBER [7]

4. MIXING TEMPERATURE (°F) [_ _ _.]

5. LAYDOWN TEMPERATURES (°F)
   Mean..... 2 8 0. Number of Tests ..... _ _.
   Minimum..... _ _ _. Maximum..... _ _ _.
   Standard Deviation... _ _.

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH NBASCZ)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	1 0.1				
7	B	Steel-Whl Tandem	_ _._				
8	C	Steel-Whl Tandem	_ _._				
9	D	Steel-Whl Tandem	_ _._				
10	E	Pneumatic-Tired	1 2.4	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._	.			
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
18	M	Double-Drum Vibr.	1 0.1		_ _ _ _.	_ _ _	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	_	_	_
24	Coverages	_ 3.	_ _.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	_	_	_
26	Coverages	_ 6.	_ _.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	_	_	_
28	Coverages	_ 2	_ _.	_ _.	_ _.
29	Air Temperature (°F)	_ 8 0.	_ _ _.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	1.9	_._	_._	_._
31	Curing Period (Days)	_ 0.1	_ _._	_ _._	_ _._

PREPARER [signature] EMPLOYE E.71 BRC DATE _____

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 8]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
0+00	0		1.7	3.2	1.6	
	36		1.8	3.0	1.9	
	72		1.7	3.2	1.8	
	108		1.8	3.1	1.7	
	144		2.3	3.0	1.8	
0+50	0		1.8	2.6	1.9	
	36		2.4	2.5	1.6	
	72		2.0	2.5	1.8	
	108		2.0	2.8	1.9	
	144		2.2	2.9	1.9	
1+00	0		1.9	2.9	1.8	
	36		2.5	2.3	1.9	
	72		2.2	2.5	2.2	
	108		2.2	2.5	2.0	
	144		2.0	3.1	1.6	
1+50	0		1.7	3.2	1.8	
	36		2.0	2.9	2.0	
	72		1.9	2.9	2.0	
	108		2.0	3.0	1.9	
	144		2.4	2.9	2.0	
2+00	0		2.3	2.6	1.8	
	36		2.3	2.4	2.0	
	72		2.0	2.6	1.9	
	108		2.4	2.5	1.9	
	144		2.3	2.5	1.9	
2+50	0		2.2	2.3	1.8	
	36		2.3	2.3	1.9	
	72		2.3	2.4	1.9	
	108		2.3 ~~3.1~~	2.4	1.9	
	144		2.5 ~~3.4~~	2.4	1.7	
3+00	0		1.9	3.1	1.6	
	36		2.2	2.5	1.8	
	72		2.0	2.5	1.9	
	108		2.0	2.5	2.2	
	144		2.3	2.6	2.3	
LAYER NUMBER			06	06	07	

PREPARER Jerome R. Dill EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 8]

LAYER THICKNESS MEASUREMENTS (Inches)

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
3+50	0		2.0	2.0	2.0	
	36		2.2	2.3	1.8	
	72		1.8	2.2	2.3	
	108		1.8	2.4	2.3	
	144		2.0	2.5	2.0	
4+00	0		2.2	2.4	2.2	
	36		2.3	2.4	2.0	
	72		2.0	2.4	2.2	
	108		1.8	2.5	2.2	
	144		2.4	2.5	1.9	
4+50	0		1.9	2.9	1.9	
	36		2.0	3.0	1.6	
	72		1.8	2.8	1.9	
	108		1.8	2.9	1.8	
	144		2.0	3.0	1.6	
5+00	0		1.9	2.6	2.2	
	36		2.2	2.5	2.0	
	72		1.9	2.8	1.9	
	108		1.8	2.9	1.9	
	144		2.3	2.6	1.7	
+—						
+—						
+—						
LAYER NUMBER		— —	06	06	07	— —
		MEAN	2.08	2.66	1.91	
		σ			0.19	

PREPARER [signature] EMPLOYER TBRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA MISCELLANIOUS CONSTRUCTION NOTES AND COMMENTS CONSTRUCTION DATA SHEET 11	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 8]

PAGE 1 OF 2

Provide any miscellanious comments and notes concering construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indicatation of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

NO "SURFACE PREPARATION" (CONSTRUCTION DATA SHEETS 3 & 4) WAS APPLIED TO THIS SECTION

SEE DATA SHEET 6 FOR DETAILS OF MILLING

STARTED PAVING RAP MILL REPLACEMENT @ 0-30' OF 48A509
FINISHED PAVING RAP MILL REPLACEMENT @ 6+50' OF 48A508
BEGAN & FINISHED ON 9/20/91 (INCLUDED SECTIONS 9 & 8)
- NO SHRP REP. PRESENT
- NO COMPLICATIONS REPORTED

STARTED PAVING 1ST LIFT OF RAP BINDER @ 0-77' OF 48A508
FINISHED PAVING 1ST LIFT OF RAP BINDER @ 5+100' OF 48A503
BEGAN & FINISHED ON 9/21/91 (INCLUDED SECTIONS 8 & 3)
- NO SHRP REP. PRESENT
- NO COMPLICATIONS REPORTED

STARTED PAVING 2ND LIFT OF RAP BINDER @ 0-100' OF 48A508
FINISHED PAVING 2ND LIFT OF RAP BINDER @ 5+130' OF 48A503
BEGAN @ 12:30 AND FINISHED @ 2:00 (ALL ON 9/25/91).
- INCLUDED SECTIONS 8 & 3

PREPARER Bernard F. Dill EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA MISCELLANIOUS CONSTRUCTION NOTES AND COMMENTS CONSTRUCTION DATA SHEET 11	* STATE CODE [48] * SPS PROJECT CODE [A5] * TEST SECTION NO. [02]

Provide any miscellanious comments and notes concering construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indicatetion of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

STARTED PAVING RAP SURFACE @ 0-101' OF 48A502

FINISHED PAVING RAP SURFACE @ 5+150' OF 48A503

BEGAN @ 9:30 AND FINISHED @ 2:10 (ALL ON 9/26/91)

- INCLUDED SECTIONS 2, 9, 8 & 3

PREPARER [signature] BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA REVISED LAYER DESCRIPTIONS CONSTRUCTION DATA SHEET 2	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 9]

1. LAYER NUMBER	2. LAYER DESCRIPTION	3. MATERIAL TYPE CLASS	4. LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 1]				
2	[0 6]	[3 6]	[10.0]	---	---	---
3	[0 5]	[2 3]	[11.0]	---	---	---
4	[0 4]	[2 8]	[7.5]	---	---	---
5	[0 3]	[0 1]	[0.0]	---	---	---
6	[0 4]	[3 4]	[1.9]	1.3	2.6	0.2
7	[0 1]	[1 3]	[2.1]	1.0	2.8	0.3
8	[ ]	[ ]	[ ]	---	---	---
9	[ ]	[ ]	[ ]	---	---	---
10	[ ]	[ ]	[ ]	---	---	---
11	[ ]	[ ]	[ ]	---	---	---
12	[ ]	[ ]	[ ]	---	---	---
13	[ ]	[ ]	[ ]	---	---	---
14	[ ]	[ ]	[ ]	---	---	---
15	[ ]	[ ]	[ ]	---	---	---

NOTES:

1. Layer 1 is subgrade soil, the highest numbered layer is the pavement surface.
2. Layer description codes:

Overlay.....01	Base Layer.....05	Porous Friction Course..09
Seal/Tack Coat.....02	Subbase Layer.....06	Surface Treatment.....10
Original Surface.....03	Subgrade.....07	Embankment (Fill).....11
HMAC Layer (Subsurface).04	Interlayer.....08	

If milling was performed, the layers which were milled shall be assigned their previous layer number and material type. If the layer was completely removed by milling, it shall still be shown as a layer with a zero thickness.

3. Enter the material type classification codes from Tables A.5, A.6, A.7 and A.8 which best describes the material in each layer. If the layer was milled, enter the material classification code corresponding to the type material which was removed.
4. Enter the average thickness of each layer and the maximum, minimum, and standard deviation of the thickness measurements, if known. If a layer was partially milled, the remaining thickness of the layer shall be indicated.

PREPARER [signature] EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA PREPARATION OF MILLED TEST SECTIONS CONSTRUCTION DATA SHEET 6	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 9]

1. DATE OF MILLING OPERATION [07-25-91]

2. MANUFACTURER OF MILLING MACHINE (Specify) CATERPILLAR

3. MILLING MACHINE MODEL DESIGNATION (Specify) CM-8/PR-450

4. WIDTH OF CUTTING HEAD (Inches) [_ 75]

5. TOTAL MILLED DEPTH (Inches)

Location	No. Measrmnts	Maximum	Minimum	Std. Dev.	Average
Inside lane edge @ ℄	11.	1.9	1.3	0.2	1.7
Outside lane edge @ SHOULDER	11.	2.2	1.3	0.3	1.7

MILLED SURFACE CHARACTERISTICS

6. Macro Texture [2]
   Fine Macro Texture (≤¼ inch)... 1 Coarse Macro Texture(>¼ inch)... 2

7. Estimate of extent of test section surface area delaminated (Percent) [0 0]

8. Height of Ridge Between Parallel Passes? (Inches) [0.1]

9. Other Comments? (Yes, No) [YES]
   Comments SHOULDERS MILLED TO TAPER DOWN TO TRAVEL LANE (FOR DRAINAGE AND SAFETY)

10. WERE PATCHES PLACED AFTER MILLING? (Yes, No) [NO]
    (If yes complete Construction Data Sheet 3)
    OPENED 1:00 PM 7/25/91, PAVING BEGAN 9/20/91 10:00

11. LENGTH OF TIME MILLED SURFACE WAS OPENED TO TRAFFIC? (Hrs.) 56 DAYS 21 HOURS [3 6 5]
12. WAS MILL REPLACEMENT LAYER THICKER THAN MILL DEPTH (YES,NO) [YES]
13. LAYER NUMBER OF MILL REPLACEMENT [6]
14. NOMINAL THICKNESS OF MILL REPLACEMENT MATERIAL (Inches) [_ 1.9]

15. TYPE OF MILL REPLACEMENT LAYER MATERIAL [2]
    "Virgin" Asphalt Concrete ..... 1 Recycled Asphalt Concrete.... 2
    Other... 3 (Specify)

16. WAS ADJACENT TRAVEL LANE MILLED TO SAME DEPTH AS TEST LANE? (Yes, No) [YES]
    IF NO, WIDTH MILLED SAME DEPTH AS TEST LANE (Feet) [_ _ . _]

17. COMMENTS
    1st Pass: - FROM SHOULDER STRIPE TO CENTER OF LANE
    - STARTED @ 0-50. OF 48A509, FINISHED @ 6+54 OF 48A508
    - STARTED @ 8:45, FINISHED @ 10:00

    2ND Pass: - FROM CENTER OF LANE TO CENTERLINE STRIPE
    - STARTED @ 0-50 OF 48A509, FINISHED @ 6+54 OF 48A508
    - STARTED @ 10:15, FINISHED @ 11:15

PREPARER [signature] EMPLOYER BRE DATE 7/25/91
9/23/91

LTPP-SPS CONSTRUCTION DATA OVERLAY PLACEMENT OPERATIONS CONSTRUCTION DATA SHEET 7	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 9]

1. DATE SURFACE PREPARATION BEGAN (Month-Day-Year) [09-20-91]
2. DATE SURFACE PREPARATION COMPLETED [09-20-91]

3. SURFACE PREPARATION PRIOR TO PLACEMENT OF OVERLAY [3]
   None..... 1 Broomed..... 2 Broomed + Asphaltic Tack Coat.... 3
   Asphaltic Tack Coat (only).... 4

4. TACK COAT
   Layer Numbers [_ _] [1 0]
   Material Type None..... 1 SS-1.... 2 SS-1H.... 3 CRS-1.... 4 [_ _]
   CRS-2.... 5 CMS-2.... 6 CMS-2H.. 7 CSS-1.... 8 CSS-1H... 9
   Other.... 10 (Specify) RC-250
5. TACK COAT DILUTION
   (Percent) [_ _]
   Mixing Rate Parts Diluent ___ TO Parts Asphalt ___
6. TACK COAT APPLICATION RATE (Gal/Sq. Yd.) [0.02]

7. ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers		
Plant 1	[2]	AZTEC, SUPER SIX PACK	[_ 1 9]	[2 5]	[6]	[7]	[_]
Plant 2	[_]		[_ _ _]	[_ _]	[_]	[_]	[_]
Plant 3	[_]		[_ _ _]	[_ _]	[_]	[_]	[_]

   Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify

8. MANUFACTURER OF ASPHALT CONCRETE PAVER BARBER GREENE
9. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER BG-260
10. SINGLE PASS LAYDOWN WIDTH (Feet) [12.5]

11. AC BINDER COURSE LIFT
    Layer Number ~~[_ _]~~
    Nominal First Lift Placement Thickness (Inches) ~~[_ _]~~
    Nominal Second Lift Placement Thickness (Inches) ~~[_._]~~
12. AC SURFACE COURSE LIFT
    Layer Number [_ 7]
    Nominal First Lift Placement Thickness (Inches) [2.1]
    Nominal Second Lift Placement Thickness (Inches) ~~[_.__]~~
13. SURFACE FRICTION COURSE
    Layer Number ~~[_ _]~~
    Nominal Placement Thickness (Inches) ~~[_ _]~~
14. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
    Binder Course ~~[_ + _ _]~~
    Surface Course ~~[_ + _ _]~~
    Surface Friction Course ~~[_ + _ _]~~
15. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2 (specify offset from O/S feet) ~~[_ _.__]~~

16. SIGNIFICANT EVENTS DURING CONSTRUCTION(disruptions, rain, equip. problems, etc.)
    2" MILL REPLACEMENT 9/20/91, BEGAN TAPER @ 0-30', RAIN 9/23/91

PREPARER [signature] EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 8	* STATE CODE [4 3] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 9]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9 - 2 0 - 9 1]
2. DATE PAVING OPERATIONS COMPLETED [0 9 - 2 0 - 9 1]

3. LAYER NUMBER [6]

4. MIXING TEMPERATURE (°F) [_ _ _.]

5. LAYDOWN TEMPERATURES (°F)
   Mean..... 2 9 0.
   Minimum..... _ _ _.
   Standard Deviation... _ _.
   Number of Tests ..... _ _.
   Maximum..... _ _ _.

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH 48A5C2)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	1 0.1				
7	B	Steel-Whl Tandem	_ _._				
8	C	Steel-Whl Tandem	_ _._				
9	D	Steel-Whl Tandem	_ _._				
10	E	Pneumatic-Tired	1 2.4	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._	.			
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	. _ _ _	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	. _ _ _	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	. _ _ _	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	. _ _ _	_ _._
18	M	Double-Drum Vibr.	1 0.1		_ _ _ _.	. _ _ _	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	. _ _ _	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	. _ _ _	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	. _ _ _	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	_	_	_
24	Coverages	_ 3.	_ _.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	_	_	_
26	Coverages	_ 6.	_ _.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	_	_	_
28	Coverages	_ 2	_ _.	_ _.	_ _.
29	Air Temperature (°F)	_ 6 0.	_ _ _.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	1.9	_._	_._	_._
31	Curing Period (Days)	_ 0.1	_ _._	_ _._	_ _._

PREPARER [signature] EMPLOYER ERE DATE _____

LTPP-SPS CONSTRUCTION DATA OVERLAY COMPACTION DATA CONSTRUCTION DATA SHEET 8	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 9]

1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 6-9 1]
2. DATE PAVING OPERATIONS COMPLETED [0 9-2 6-9 1]

3. LAYER NUMBER [7]

4. MIXING TEMPERATURE (°F) [_ _ _.]

5. LAYDOWN TEMPERATURES (°F)
   Mean..... 2 8 0.
   Minimum..... _ _ _.
   Standard Deviation... _ _.
   Number of Tests ..... _ _.
   Maximum..... _ _ _.

ROLLER DATA (ORIGINAL ROLLER DATA FILED WITH 48A502)

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	1 0.1				
7	B	Steel-Whl Tandem	_ _._				
8	C	Steel-Whl Tandem	_ _._				
9	D	Steel-Whl Tandem	_ _._				
10	E	Pneumatic-Tired	1 2.4	_ _ _ _.			
11	F	Pneumatic-Tired	_ _._	_ _ _ _.			
12	G	Pneumatic-Tired	_ _._	_ _ _ _.			
13	H	Pneumatic-Tired	_ _._	.			
14	I	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
15	J	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
16	K	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
17	L	Single-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
18	M	Double-Drum Vibr.	1 0.1		_ _ _ _.	_ _ _	_ _._
19	N	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
20	O	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
21	P	Double-Drum Vibr.	_ _._		_ _ _ _.	_ _ _	_ _._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	_	_	_
24	Coverages	_ 3.	_ _.	_ _.	_ _.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	_	_	_
26	Coverages	_ 6	_ _.	_ _.	_ _.
	FINAL				
27	Roller Code (A-Q)	A	_	_	_
28	Coverages	_ 2	_ _.	_ _.	_ _.
29	Air Temperature (°F)	_ 8 0.	_ _ _.	_ _ _.	_ _ _.
30	Compacted Thickness (In)	2.1	_._	_._	_._
31	Curing Period (Days)	_ 0.1	_ _._	_ _._	_ _._

PREPARER [signature] EMPI. BRE DATE

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 9]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
0+50						
0+00	0 36 72 108 144		2.6 2.0 1.7 1.4 1.3		1.8 2.4 2.5 2.6 2.5	
0+50	0 36 72 108 144		1.8 2.0 2.2 2.0 1.9		2.4 2.4 2.3 2.3 2.4	
1+00	0 36 72 108 144		1.8 1.9 2.0 2.0 2.0		2.3 2.2 2.2 2.2 1.9	
1+50	0 36 72 108 144		1.3 1.7 ~~2.0~~ 1.7 ~~1.9~~ 1.6 ~~2.0~~ 1.7 ~~2.4~~		2.8 2.5 2.4 2.5 2.2	
2+00	0 36 72 108 144		1.7 1.8 1.7 1.8 1.8		1.9 2.0 2.0 2.0 1.9	
2+50	0 36 72 108 144		2.0 1.9 1.8 1.9 2.0		2.4 2.5 2.4 2.5	
LAYER NUMBER			06		07	

~~MEAN 1.9~~
~~STD DEV 0.3~~ (SEE NEXT PAGE)

PREPARER [signature] EMPLOYER FHRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA LAYER THICKNESS MEASUREMENTS CONSTRUCTION DATA SHEET 10	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 9]

LAYER THICKNESS MEASUREMENTS (Inches)

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	RUT LEVEL-UP	MILL REPLACEMENT	BINDER COURSE	SURFACE COURSE	SURFACE FRCTION LAYER
3+00	0		1.7		2.4	
	36		1.7		2.0	
	72		1.8		2.2	
	108		1.8		2.2	
	144		1.7		2.2	
3+50	0		1.8		1.6	
	36		2.0		1.9	
	72		1.9		1.9	
	108		1.8		2.2	
	144		2.2		2.2	
4+00	0		2.0		1.0	
	36		1.9		1.6	
	72		1.8		2.2	
	108		1.9		2.2	
	144		1.9		2.0	
4+50	0		1.9		1.9	
	36		1.8		2.0	
	72		1.8		2.0	
	108		1.7		2.2	
	144		1.8		2.0	
5+00	0		1.9		1.6	
	36		2.0		1.8	
	72		1.9		1.8	
	108		1.9		1.9	
	144		2.0		1.7	
5+50						
+						
LAYER NUMBER			06		07	
		MEAN	1.9		2.1	
		STD. DEV.	0.2		0.3	

PREPARER Jerome S. Dell EMPLOYER BRE DATE 10/3/91

LTPP-SPS CONSTRUCTION DATA MISCELLANIOUS CONSTRUCTION NOTES AND COMMENTS CONSTRUCTION DATA SHEET 11	* STATE CODE [4 8] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 9]

Provide any miscellanious comments and notes concering construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indicatation of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

No "SURFACE PREPARATION" (CONSTRUCTION DATA SHEETS 3 & 4)
WAS APPLIED TO THIS SECTION

SEE DATA SHEET 6 FOR DETAILS OF MILLING

STARTED PAVING RAP MILL REPLACEMENT @ 0-30' OF 48A509
FINISHED PAVING RAP MILL REPLACEMENT @ 6+50' OF 48A508
BEGAN & FINISHED ON 9/20/91 (INCLUDED SECTIONS 9 & 8)
- NO SHRP REP. PRESENT
- NO COMPLICATIONS REPORTED

STARTED PAVING RAP SURFACE @ 0-101' OF 48A502
FINISHED PAVING RAP SURFACE @ 5+150' OF 48A503
BEGAN @ 9:30 AND FINISHED @ 2:10 (ALL ON 9/26/91)
- INCLUDED SECTIONS 2, 9, 8 & 3

PREPARER [signature] EMPLOYER BRE DATE 10/3/91

Revised September 18, 1989

*STATE ASSIGNED ID [_ _ _ _]

SHEET 11

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [A 5 0 3]

LTPP PROGRAM

ITEM 340
TYPE C RAP
"COARSE GRADED"
SURFACE COURSE

HOT MIX RECYCLED ASPHALT PAVEMENT
GENERAL INFORMATION AND RECLAIMED AGGREGATE PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [7] (SEE 42A503 FOR MIX DESIGN ORIGINAL)

GENERAL INFORMATION

* 2. PROCEDURE USED TO BREAK UP AND/OR REMOVE THE ASPHALT PAVEMENT [4]

Scarifying..... 1 Ripping..... 3
Grid Rolling..... 2 Cold Milling..... 4
Other (Specify)_____ 5

* 3. PAVEMENT PROCESSING [_]

None..... 1
Crushed and Screened..... 2
Pulverized by Hammermill..... 3
Pulverized by Grid or V-Cleated Roller..... 4
Other (Specify)_____ 5

RECLAIMED AGGREGATE PROPERTIES

* 4. GRADATION OF RECLAIMED AGGREGATES

Sieve Size or No.	% Passing	Sieve Size or No.	% Passing
2".....	[_ _ _]	No. 4.....	[6 8]
1 1/2".....	[_ _ _]	No. 8.....	[_ _]
1".....	[_ _ _]	No. 10.....	[4 1]
7/8".....	[1 0 0]	No. 16.....	[_ _]
3/4 ".....	[_ _ _]	No. 30.....	[_ _]
5/8".....	[_ 9 9]	No. 40.....	[2 5]
1/2".....	[_ _ _]	No. 50.....	[_ _]
3/8".....	[9 4]	No. 80.....	[_ 7]
		No. 100.....	[_ _]
		No. 200.....	[_ 1]

BULK SPECIFIC GRAVITIES (Items 5. to 8.)

* 5. COARSE AGGREGATE (AASHTO T85 OR ASTM C127) [_._ _ _]
* 6. FINE AGGREGATE (AASHTO T84 OR ASTM C128) [_._ _ _]
* 7. MINERAL FILLER (AASHTO T100 OR ASTM D854) [_._ _ _]
* 8. AGGREGATE COMBINATION (CALCULATED - EQ. 7.1) [2.4 9 5]

9. EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATION (CALCULATED - EQ. 7.2) _._ _ _

Revised September 18, 1989

SHEET 12

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
UNTREATED AGGREGATE PROPERTIES

* 1.LAYER NUMBER (FROM SHEET 2) [7]

COMPOSITION OF COARSE AGGREGATE (Items 2., 3., and 4.)

			TYPE	PERCENT
Crushed Stone.....1	Crushed Slag.....4	* 2.	[1]	[1 0 0.]
Gravel.....2	Manufactured	* 3.	[_]	[_ _ _.]
Crushed Gravel....3	Lightweight.....5	* 4.	[_]	[_ _ _.]
Other (Specify)_____6				

* 5.GEOLOGIC CLASSIFICATION OF COARSE AGGREGATE [0 1.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE (Items 6., 7., and 8.)

		TYPE	PERCENT
Natural Sand..... 1	* 6.	[2]	[_ 5 6.]
Manufactured Sand (From	* 7.	[1]	[_ 4 4.]
Crushed Gravel or Stone)..... 2	* 8.	[_]	[_ _ _.]
Recycled Concrete..... 3			
Other (Specify)_____ 4			

SOURCE (Items 9. and 10.)

Reclaimed Base Material..... 1	* 9.	COARSE	[2]
Pit (Original Use)..... 2	*10.	FINE	[2]

*11.TYPE OF MINERAL FILLER [_]

Stone Dust..... 1	Portland Cement... 3
Hydrated Lime..... 2	Fly Ash..... 4
Other (Specify)_____ 5	

AGGREGATE DURABILITY TEST RESULTS (Items 12. to 15.)
(SEE DURABILITY TEST TYPE CODES,TABLE A.13)

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
12.	COARSE	_ _	_ _ _._ _ _
13.	COARSE	_ _	_ _ _._ _ _
14.	COARSE	_ _	_ _ _._ _ _
15.	COMBINED COARSE AND FINE	_ _	_ _ _._ _ _

16.POLISH VALUE OF COARSE AGGREGATES 3 5.
(SURFACE LAYER ONLY) (AASHTO T279, ASTM D3319)

Revised September 18, 1989

SHEET 13	*STATE ASSIGNED ID	[_ _ _ _]
REHABILITATION DATA	*STATE CODE	[4 8]
LTPP PROGRAM	*SHRP SECTION ID	[4 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
UNTREATED AGGREGATE PROPERTIES (CONTINUED)

* 1. LAYER NUMBER (FROM SHEET 2) [7]

* 2. GRADATION OF UNTREATED AGGREGATES

Sieve Size or No.	% Passing	Sieve Size or No.	% Passing
2".....	[_ _ _]	No. 4.....	[4 3]
1 1/2".....	[_ _ _]	No. 8.....	[_ _]
1".....	[_ _ _]	No. 10.....	[3 4]
7/8".....	[1 0 0]	No. 16.....	[_ _]
3/4 ".....	[_ _ _]	No. 30.....	[_ _]
5/8".....	[_ 9 7]	No. 40.....	[2 5]
1/2".....	[_ _ _]	No. 50.....	[_ _]
3/8".....	[5 8]	No. 80.....	[_ 8]
		No. 100.....	[_ _]
		No. 200.....	[_ 2]

BULK SPECIFIC GRAVITIES (Items 3. to 6.)

* 3.	COARSE AGGREGATE (AASHTO T85 OR ASTM C127)	[2.8 1 7]
* 4.	FINE AGGREGATE (AASHTO T84 OR ASTM C128)	[2.6 7 8]
* 5.	MINERAL FILLER (AASHTO T100 OR ASTM D854)	[_._ _ _]
* 6.	AGGREGATE COMBINATION (CALCULATED - EQ. 7.1)	[2.7 5 7]

7. EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATION (CALCULATED - EQ. 7.2) _._ _ _

Revised September 18, 1989

*STATE ASSIGNED ID [_ _ _ _]

SHEET 14

REHABILITATION DATA

LTPP PROGRAM

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
COMBINED AGGREGATE PROPERTIES

* 1.LAYER NUMBER (FROM SHEET 2) [7]

* 2.AMOUNT OF UNTREATED AGGREGATE ADDED [6 5.0]
(PERCENT BY WEIGHT OF COMBINED AGGREGATE IN RECYCLED MIX)

* 3.GRADATION OF COMBINED AGGREGATES

Sieve Size or No.	% Passing	Sieve Size or No.	% Passing
2".....	[_ _ _]	No. 4.....	[5 2]
1 1/2".....	[_ _ _]	No. 8.....	[_ _]
1".....	[_ _ _]	No. 10.....	[3 6]
7/8".....	[1 0 0]	No. 16.....	[_ _]
3/4 ".....	[_ _ _]	No. 30.....	[_ _]
5/8".....	[_ 9 8]	No. 40.....	[2 5]
1/2".....	[_ _ _]	No. 50.....	[_ _]
3/8".....	[7 1]	No. 80.....	[_ 8]
		No. 100.....	[_ _]
		No. 200.....	[_ 2]

BULK SPECIFIC GRAVITIES (Items 4. to 7.)

* 4. COARSE AGGREGATE (AASHTO T85 OR ASTM C127) [_._ _ _]

* 5. FINE AGGREGATE (AASHTO T84 OR ASTM C128) [_._ _ _]

* 6. MINERAL FILLER (AASHTO T100 OR ASTM D854) [_._ _ _]

* 7. AGGREGATE COMBINATION (CALCULATED - EQ. 7.1) [2 6 5 9]

8.EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATION (CALCULATED - EQ. 7.2) _._ _ _

Revised September 18, 1989

SHEET 15

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [4 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
RECLAIMED ASPHALT CEMENT PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [_]

* 2. SPECIFIC GRAVITY OF ASPHALT CEMENT (AASHTO T220 OR ASTM D70) [_._ _ _]

* 3. VISCOSITY OF ASPHALT AT 140°F (POISES) (AASHTO T202 OR ASTM D2171) [_ _ _ _ _ _.]

* 4. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES) (AASHTO T201 OR ASTM D2170) [_ _ _ _._ _]

* 5. PENETRATION AT 77°F (AASHTO T49 OR ASTM D5) (TENTHS OF A MM) (100 G., 5 SEC.) [_ _ _.]

6. DUCTILITY AT 77°F (CM) (AASHTO T51) _ _ _.

7. DUCTILITY AT 39.2°(CM) (AASHTO T51) _ _ _.

8. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN) _ _ _.

9. PENETRATION AT 39.2°F (AASHTO T49) (TENTHS OF A MM) (200 G., 60 SEC.) _ _ _.

10. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) _ _ _.

Revised September 18, 1989

SHEET 16

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
NEW ASPHALT CEMENT PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [7]

* 2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [0 2]
(IF OTHER, SPECIFY _____)

* 3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [5 5]
(IF OTHER, SPECIFY _____)

* 4. SPECIFIC GRAVITY OF ASPHALT CEMENT
(AASHTO T228 OR ASTM D70) [0.9 8 5]

* 5. VISCOSITY OF ASPHALT AT 140°F (POISES)
(AASHTO T202 OR ASTM D2171) [_ _ _ _ _ _.]

* 6. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES)
(AASHTO T201 OR ASTM D2170) [_ _ _ _._ _]

* 7. PENETRATION AT 77°F (AASHTO T49 OR ASTM D5)
(TENTHS OF A MM) (100 G., 5 SEC.) [_ _ _.]

8. DUCTILITY AT 77°F (CM)
(AASHTO T51 OR ASTM D113) _ _ _.

9. DUCTILITY AT 39.2°(CM)
(AASHTO T51 OR ASTM D113) _ _ _.

10. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN) _ _ _.

11. PENETRATION AT 39.2°F (AASHTO T49 OR ASTM D5)
(TENTHS OF A MM) (200 G., 60 SEC.) _ _ _.

12. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) _ _ _.

Revised September 18, 1989

SHEET 17

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
COMBINED ASPHALT CEMENT PROPERTIES

* 1.LAYER NUMBER (FROM SHEET 2) [7]

	TYPE	QUANTITY(%)
* 2.RECYCLING AGENT (SEE TYPE CODE, TABLE A.20) (IF OTHER, SPECIFY TYPE _____)	[_ _]	[_ _.]
* 3.AMOUNT OF NEW ASPHALT CEMENT ADDED (PERCENT BY WEIGHT OF RECYCLED MIXTURE WEIGHT)		[_ 2.7]
*4.SPECIFIC GRAVITY OF ASPHALT CEMENT (AASHTO T228 OR ASTM D70)		[_._ _ _]
* 5.VISCOSITY OF ASPHALT AT 140°F (POISES) (AASHTO T202 OR ASTM D2171)		[_ _ _ _ _ _.]
* 6.VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES) (AASHTO T201 OR ASTM D2170)		[_ _ _ _._ _]
* 7.PENETRATION AT 77°F (AASHTO T49 OR ASTM D5) (TENTHS OF A MM) (100 G., 5 SEC.)		[_ _ _.]

ASPHALT MODIFIERS (SEE TYPE CODE, TABLE A.15) (Items 8. and 9.)
(OTHER THAN RECYCLING AGENT)

	TYPE	QUANTIFY(%)
8.MODIFIER #1	[_ _.]	[_ _.]
9.MODIFIER #2	[_ _.]	[_ _.]
(IF OTHER, SPECIFY TYPE _____)		

10.DUCTILITY AT 77°F (CM) (AASHTO T51 OR ASTM D113)	_ _ _.
11.DUCTILITY AT 39.2°(CM) (AASHTO T51)	_ _ _.
12.TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN)	_ _ _.
13.PENETRATION AT 39.2°F (AASHTO T49 OR ASTM D5) (TENTHS OF A MM) (200 G., 60 SEC.)	_ _ _.
14.RING AND BALL SOFTENING POINT (AASHTO T53) (°F)	_ _ _.

Revised September 18, 1989

SHEET 18	*STATE ASSIGNED ID	[_ _ _ _]
REHABILITATION DATA	*STATE CODE	[4 8]
LTPP PROGRAM	*SHRP SECTION ID	[A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
LABORATORY AGED COMBINED ASPHALT CEMENT PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [7]

2. TEST PROCEDURE USED TO MEASURE AGING EFFECTS _
   ASTM D1754 - Thin Film Oven Test..... 1
   ASTM D2872 - Rolling Thin Film Oven Test..... 2
   Other (Specify)_____ 3

3. VISCOSITY OF ASPHALT AT 140°F (POISES) _ _ _ _ _ _.
   (AASHTO T202 OR ASTM D2171)

4. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES) _ _ _ _._ _
   (AASHTO T201 OR ASTM D2170)

5. DUCTILITY AT 77°F (CM) (AASHTO T51 OR ASTM D113) _ _ _.

6. DUCTILITY AT 39.2°F (CM) (AASHTO T51 OR ASTM D113) _ _ _.

7. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN) _ _.

8. PENETRATION AT 77°F, 100 G., 5 SEC.
   (TENTHS OF A MM) (AASHTO T49 OR ASTM D5) _ _ _.

9. PENETRATION AT 39.2°F, 200 G., 60 SEC.
   (TENTHS OF A MM) (AASHTO T49 OR ASTM D5) _ _.

10. RING AND BALL SOFTENING POINT (°F) (AASHTO T53) _ _ _.

11. WEIGHT LOSS (PERCENT) _.

Revised September 18, 1989

SHEET 19	*STATE ASSIGNED ID	[_ _ _ _]
REHABILITATION DATA	*STATE CODE	[4 8]
LTPP PROGRAM	*SHRP SECTION ID	[A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
LABORATORY MIXTURE DESIGN

* 1. LAYER NUMBER (FROM SHEET 2)	[7]
2. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) (EQ. 7.3)	2.542
3. BULK SPECIFIC GRAVITY (ASTM D1188)	2.441
4. OPTIMUM ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX) (AASHTO T164 OR ASTM D2172)	4.5
5. PERCENT AIR VOIDS (EQ. 7.4)	4.0
6. MARSHALL STABILITY (LBS) (AASHTO T245 OR ASTM D1559)	_ _ _ _.
7. NUMBER OF BLOWS	_ _.
8. MARSHALL FLOW (HUNDREDTHS OF AN INCH) (AASHTO T245 OR ASTM D1559)	_ _ _ _.
9. HVEEM STABILITY (AASHTO T246 OR ASTM D1561)	50.
10. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) (AASHTO T246 OR ASTM D1561)	265.

Revised December 15, 1989

*STATE ASSIGNED ID [_ _ _ _]

SHEET 20

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [1 5 0 3]

LTPP PROGRAM

HOT MIX RECYCLED ASPHALT PAVEMENT
MIXTURE PROPERTIES AS PLACED

* 1.LAYER NUMBER (FROM SHEET 2) [7]

* 2.TYPE OF SAMPLES [_]
Mixed in Field, Compacted in Laboratory..... 1
Mixed and Compacted in Field..... 2

* 3.MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) (EQ. 7.3) [_._ _ _]

* 4.BULK SPECIFIC GRAVITY (ASTM D1188)
MEAN .....[_._ _ _] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _._ _ _ MAXIMUM ..... _._ _ _
STD. DEV. .... _._ _ _

* 5.ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX)
(AASHTO T164 OR ASTM D2172)
MEAN .....[_ _._] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. ..... _ _._

* 6.PERCENT AIR VOIDS (EQ. 7.4)
MEAN .....[_ _._] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. ..... _ _._

7.VOIDS IN MINERAL AGGREGATE (PERCENT) (EQ. 7.5)
MEAN .....[_ _._] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. .... _ _._

8.EFFECTIVE ASPHALT CONTENT (PERCENT) (EQ. 7.6)
MEAN .....[_ _._] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. .... _ _._

Revised December 15, 1989

SHEET 21

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
MIXTURE PROPERTIES AS PLACED (CONTINUED)

* 1.LAYER NUMBER (FROM SHEET 2) [7]

* 2.TYPE ASPHALT PLANT [2]
Batch Plant..... 1 Drum Mix Plant..... 2
Other (Specify)_____ 3

* 3.TYPE OF ANTISTRIPPING AGENT
(SEE TYPE CODES, TABLE A.21) [0 2]
(OTHER, SPECIFY _____)

* 4.ANTISTRIPPING AGENT LIQUID OR SOLID CODE [1]
Liquid..... 1 Solid..... 2

* 5. AMOUNT OF ANTISTRIPPING AGENT [_ 1.0]
(If LIQUID, ENTER AMOUNT AS PERCENT OF ASPHALT CEMENT WEIGHT.
IF SOLID, ENTER AMOUNT AS PERCENT OF AGGREGATE WEIGHT.)

6.MOISTURE SUSCEPTIBILITY TEST TYPE 5
AASHTO T165 (ASTM D1075)..... 1
Texas Freeze-Thaw Pedestal Test (Ref 21)..... 2
Texas Boiling Test (Ref 22)..... 3
Revised Lottman Procedure (AASHTO T283)..... 4
Other (Specify) TEST ZE3 w/ 1.0% ANTI-STRIP AGENT 5

7.MOISTURE SUSCEPTIBILITY TEST RESULTS
HVEEM STABILITY NO. _ _.
PERCENT STRIPPED 0 8.
TENSILE STRENGTH RATIO (AASHTO T283) 0.7 5
INDEX OF RETAINED STRENGTH (AASHTO T165) _ _ _.

RECEIVED SEP 2 0 1991

TEXAS DEPARTMENT OF TRANSPORTATION
HOT MIX DESIGN

Control: 197-3-49
Project: FR136(24)
Highway: US 175
Item: 340 Ty C (Polish Value Req'd)
Producer: Brown & Root, Inc.

Engineer: Albert B. Harlan
Lab. No: 18-91-1892

September 16, 1991

HOT MIX DESIGN: ITEM 340 Ty C

Control:	197-3-49	Producer:	Brown & Root Inc.
Project:	FR136(24)		
Highway:	US 175	Design No:	18-91-1892
Engineer:	Albert B. Harlan	Date Reported:	September 16, 1991

MATERIAL IDENTIFICATION

18-91-1893	Ty C Traprock	Meridian Aggr.	Mill Creek Ok
18-91-1892	Recycled HMAC	Texas D.O.T.	FM740 & US175
18-91-1894	Ty D Traprock	Meridian Aggr.	Mill Creek OK
18-91-1895	Granite Scrns	Meridian Aggr.	Mill Creek Ok
18-91-1896	Field Sand	B&M Sand & Grav.	Seagoville Tx
	AC-5 Asphalt	Total Petroleum	Ardmore Ok
18-91-1892	Perma Tac Plus	Scan Road	Waco Tx

PHYSICAL PROPERTIES

Material	Property	Design Value	Specs
Ty C Traprock	Specific Gravity	2.829	
(74% Trap.)(26% Granite)	Absorption	0.4 %	
PV = 35	Decantation	0.5 %	
Recycled HMAC	Specific Gravity	2.495	
Ty D Traprock	Specific Gravity	2.784	
(56% Trap.)(44% Granite)	Absorption	0.4 %	
PV = 34	Decantation	0.2 %	
Granite Scrns	Specific Gravity	2.674	
	Absorption	0.3 %	
	Decantation	0.5 %	
	Plasticity Index	5	max. 6
Field Sand	Specific Gravity	2.682	
	Plasticity Index	5	max. 6
Coarse Aggr	Polish Value	35	min 35
Combined Aggr	Sand Equivalent	65	min 45
AC-5 Asphalt	Specific Gravity	0.985	
Perma Tac Plus	Specific Gravity	1.047	

District 18 Laboratory
MEETS
SPECIFICATIONS

AGGREGATE GRADATION

Sieve Sizes	Field Sand	Granite Screenings	Ty D Cr Granite	Recycled HMAC *	Ty C Cr Granite
+ 7/8"	0.0	0.0	0.0	0.0	0.0
7/8" - 5/8"	0.0	0.0	0.0	1.0	7.2
5/8" - 3/8"	0.0	0.0	20.2	4.7	82.8
3/8" - #4	0.0	3.8	66.8	26.4	8.8
#4 - #10	0.0	30.7	11.7	27.3	0.0
+ #10	0.0	34.5	98.7	59.4	98.8
#10 - #40	1.7	40.2	0.4	15.9	0.1
#40 - #80	71.8	11.8	0.1	17.8	0.2
#80 - #200	24.4	6.6	0.2	5.6	0.3
- #200	2.1	6.9	0.6	1.3	0.6

* NOTE: Recycled HMAC included 5.0% asphalt.

PROPOSED DESIGN PERCENTAGES

Aggregate	Design Percentage
Field Sand	12.0
Granite Scrns	15.0
Ty D Traprock	10.0
Recycled HMAC	35.0
Ty C Traprock	28.0

PROPOSED JOB-MIX FORMULA

Sieve Sizes	Job-Mix Formula	Mixture Tolerances	Specifications
+ 7/8"	0.0	0	0
7/8" - 5/8"	2.4	0.0 - 5.0	0 - 5
5/8" - 3/8"	26.8	21.8 - 31.8	16 - 42
3/8" - #4	19.0	14.0 - 24.0	11 - 37
#4 - #10	15.4	11.0 - 20.4	11 - 32
+ #10	63.6	58.6 - 68.6	54 - 74
#10 - #40	11.8	8.8 - 14.8	6 - 32
#40 - #80	16.6	13.6 - 19.6	4 - 27
#80 - #200	6.0	3.0 - 9.0	3 - 27
- #200	2.0	1.0 - 5.0	1 - 8
Asphalt Content	4.5	4.2 - 4.8	2.0 - 7.0

District 18 Laboratory

MEETS

SPECIFICATIONS

MOLDED SPECIMEN RESULTS

Asph. Added (%)	Total(%) Asphalt Content	Actual Sp Gr	Theor Sp Gr (Corr)	Percent Density	Percent Stability	Cohesio-meter Value	VMA (%)
2.0	3.8	2.424	2.572	94.2	55	182	8.9
3.0	4.8	2.453	2.530	97.0	51	310	7.8
4.0	5.8	2.455	2.490	98.6	15	263	7.7
5.0	6.8	2.439	2.451	99.5	too low	176	8.3
2.7	4.5	2.441	2.542	96.0	50	265	8.2

990 grams for a 2 in. specimen.

STRIP TEST DETERMINATION (OPTIMUM ASPH CONTENT)

Percent Anti-Strip Agent Used	Percent Stripping Tex-530-C	Tensile Strength Ratio Tex-531-C
0.0	50.0	N/A
0.5	15.0	0.59
1.0	8.0	0.75

Recommended Percent Anti-strip: 1.0 Minimum TSR: 0.70 (spec's)

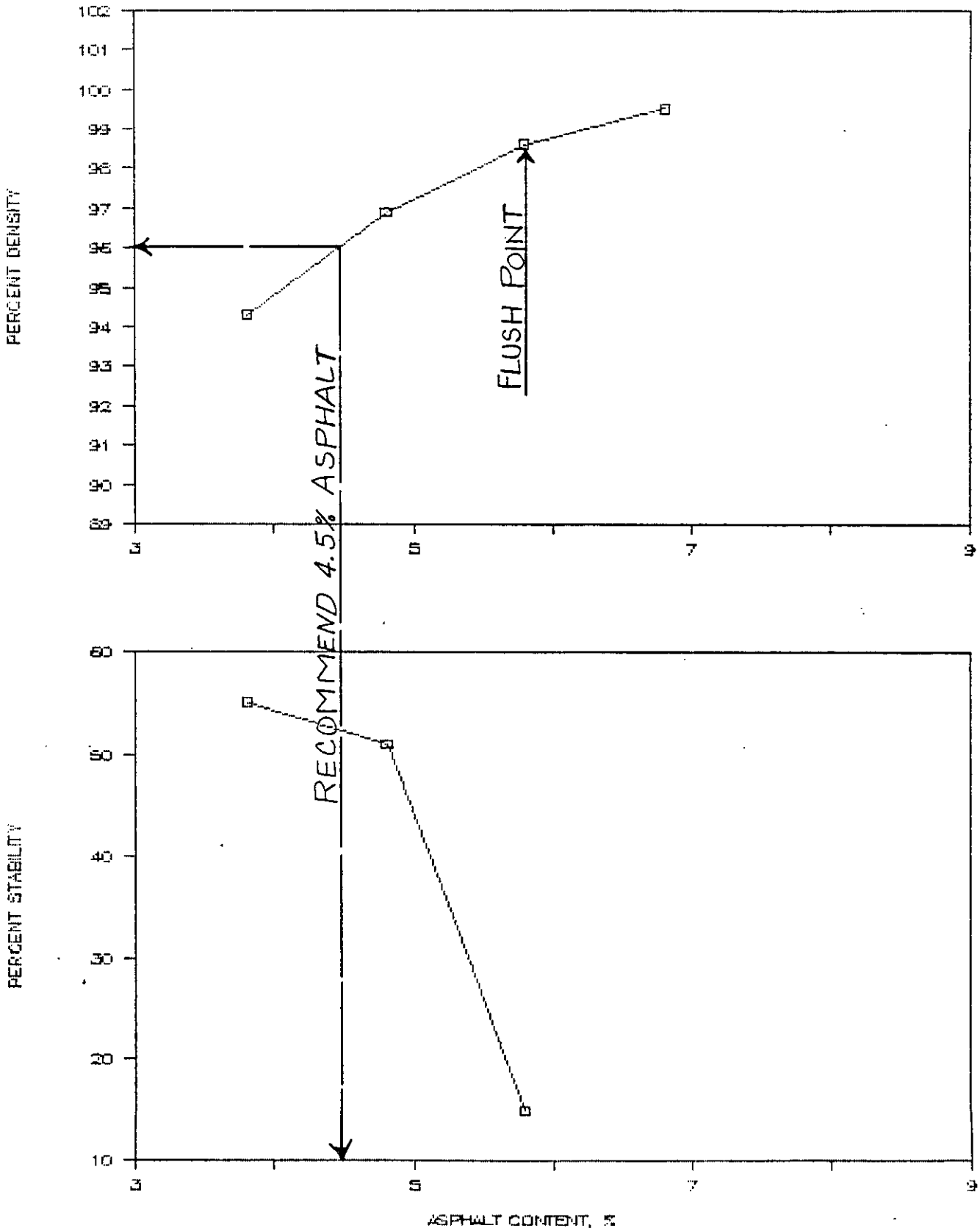
NOTE: Submit a sample of the completed mix to the District 18 Laboratory on the first day of production for a strip test.

District 18 Laboratory

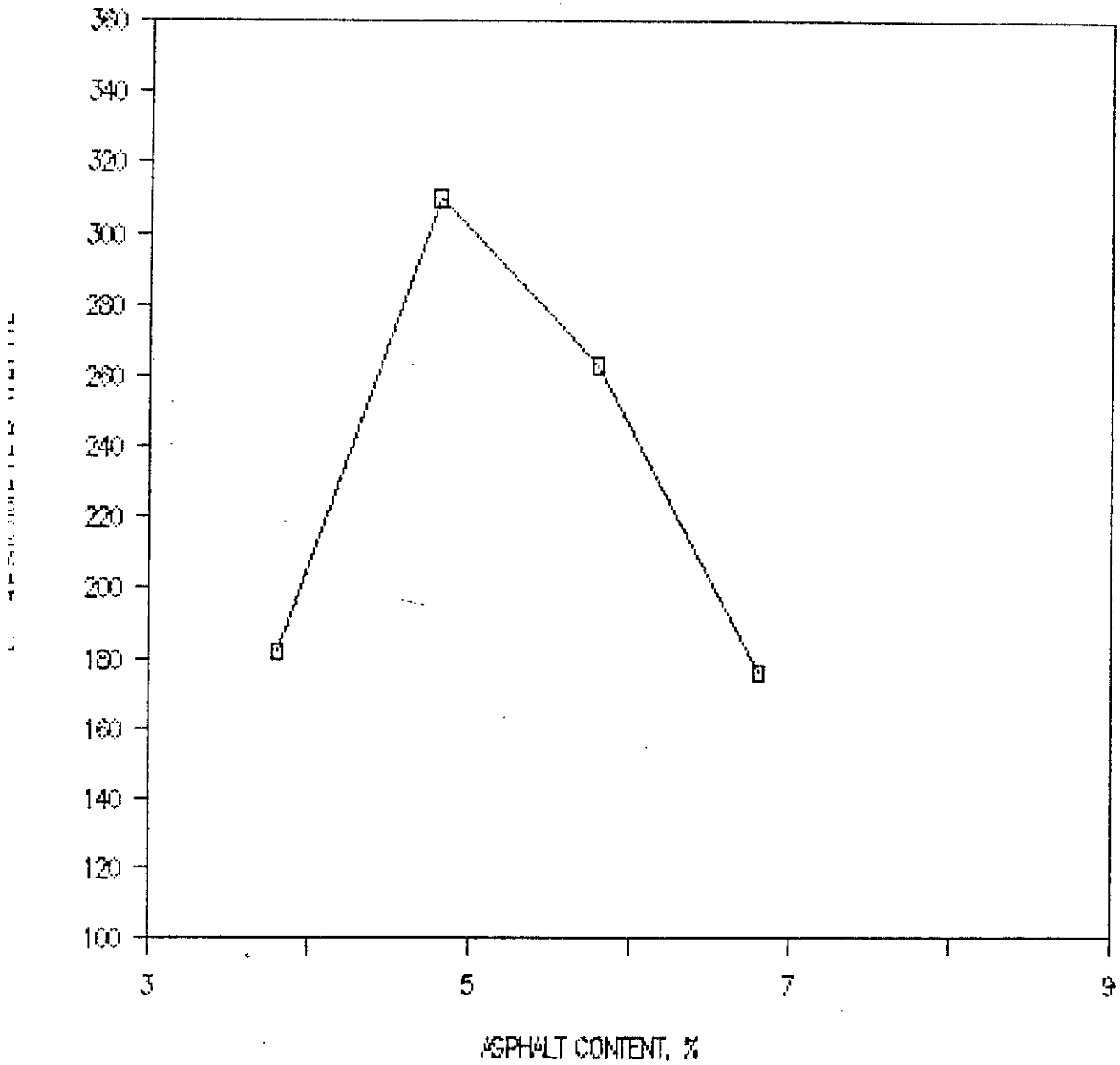
MEETS

SPECIFICATIONS

HOT MIX DESIGN



COHESION VS. ASPHALT CONTENT



Revised September 18, 1989

*STATE ASSIGNED ID [_ _ _ _]

SHEET 11

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [A 5 0 3]

LTPP PROGRAM

ITEM 340
TYP. B. RAP
"FINE GRADED"
LEVEL-UP COURSE

HOT MIX RECYCLED ASPHALT PAVEMENT
GENERAL INFORMATION AND RECLAIMED AGGREGATE PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [6]

GENERAL INFORMATION

* 2. PROCEDURE USED TO BREAK UP AND/OR REMOVE THE ASPHALT PAVEMENT [4]

Scarifying..... 1 Ripping..... 3
Grid Rolling..... 2 Cold Milling..... 4
Other (Specify)_____ 5

* 3. PAVEMENT PROCESSING [_]

None..... 1
Crushed and Screened..... 2
Pulverized by Hammermill..... 3
Pulverized by Grid or V-Cleated Roller..... 4
Other (Specify)_____ 5

RECLAIMED AGGREGATE PROPERTIES

* 4. GRADATION OF RECLAIMED AGGREGATES

Sieve Size or No.	% Passing	Sieve Size or No.	% Passing
2".....	[_ _ _]	No. 4.....	[6 8]
1 1/2".....	[_ _ _]	No. 8.....	[_ _]
1".....	[_ _ _]	No. 10.....	[4 1]
7/8".....	[1 0 0]	No. 16.....	[_ _]
3/4 ".....	[_ _ _]	No. 30.....	[_ _]
5/8".....	[_ 9 9]	No. 40.....	[2 5]
1/2".....	[_ _ _]	No. 50.....	[_ _]
3/8".....	[9 4]	No. 80.....	[_ 7]
		No. 100.....	[_ _]
		No. 200.....	[_ 1]

BULK SPECIFIC GRAVITIES (Items 5. to 8.)

* 5. COARSE AGGREGATE (AASHTO T85 OR ASTM C127) [_._ _ _]
* 6. FINE AGGREGATE (AASHTO T84 OR ASTM C128) [_._ _ _]
* 7. MINERAL FILLER (AASHTO T100 OR ASTM D854) [_._ _ _]
* 8. AGGREGATE COMBINATION (CALCULATED - EQ. 7.1) [2.4 8 2]

9. EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATION (CALCULATED - EQ. 7.2) _._ _ _

Revised September 18, 1989

SHEET 12

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
UNTREATED AGGREGATE PROPERTIES

* 1.LAYER NUMBER (FROM SHEET 2) [6]

COMPOSITION OF COARSE AGGREGATE (Items 2., 3., and 4.)

			TYPE	PERCENT
Crushed Stone.....1	Crushed Slag.....4	* 2.	[1]	[1 0 0.]
Gravel.....2	Manufactured	* 3.	[_]	[_ _ _.]
Crushed Gravel....3	Lightweight.....5	* 4.	[_]	[_ _ _.]
Other (Specify)_____	6			

* 5.GEOLOGIC CLASSIFICATION OF COARSE AGGREGATE [0 1.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE (Items 6., 7., and 8.)

		TYPE	PERCENT
Natural Sand..... 1	* 6.	[2]	[_ 4 5.]
Manufactured Sand (From	* 7.	[1]	[_ 5 5.]
Crushed Gravel or Stone)..... 2	* 8.	[_]	[_ _ _.]
Recycled Concrete..... 3			
Other (Specify)_____ 4			

SOURCE (Items 9. and 10.)

Reclaimed Base Material..... 1	* 9.	COARSE	[2]
Pit (Original Use)..... 2	*10.	FINE	[2]

*11.TYPE OF MINERAL FILLER [_]

Stone Dust..... 1	Portland Cement... 3
Hydrated Lime..... 2	Fly Ash..... 4
Other (Specify)_____ 5	

AGGREGATE DURABILITY TEST RESULTS (Items 12. to 15.)
(SEE DURABILITY TEST TYPE CODES,TABLE A.13)

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
12.	COARSE	_ _	_ _ _._ _ _
13.	COARSE	_ _	_ _ _._ _ _
14.	COARSE	_ _	_ _ _._ _ _
15.	COMBINED COARSE AND FINE	_ _	_ _ _._ _ _

16.POLISH VALUE OF COARSE AGGREGATES _ _.
(SURFACE LAYER ONLY) (AASHTO T279, ASTM D3319)

Revised September 18, 1989

*STATE ASSIGNED ID	[_ _ _ _]
*STATE CODE	[4 8]
*SHRP SECTION ID	[A 5 0 3]

SHEET 13

REHABILITATION DATA

LTPP PROGRAM

HOT MIX RECYCLED ASPHALT PAVEMENT
UNTREATED AGGREGATE PROPERTIES (CONTINUED)

* 1. LAYER NUMBER (FROM SHEET 2) [6]

* 2. GRADATION OF UNTREATED AGGREGATES

Sieve Size or No.	% Passing	Sieve Size or No.	% Passing
2".....	[_ _ _]	No. 4.....	[3 7]
1 1/2".....	[_ _ _]	No. 8.....	[_ _]
1".....	[1 0 0]	No. 10.....	[2 9]
7/8".....	[_ 9 8]	No. 16.....	[_ _]
3/4 ".....	[_ _ _]	No. 30.....	[_ _]
5/8".....	[_ 8 0]	No. 40.....	[2 3]
1/2".....	[_ _ _]	No. 50.....	[_ _]
3/8".....	[5 6]	No. 80.....	[_ 8]
		No. 100.....	[_ _]
		No. 200.....	[_ 2]

BULK SPECIFIC GRAVITIES (Items 3. to 6.)

* 3.	COARSE AGGREGATE (AASHTO T85 OR ASTM C127)	[2.7 4 1]
* 4.	FINE AGGREGATE (AASHTO T84 OR ASTM C128)	[2.6 7 8]
* 5.	MINERAL FILLER (AASHTO T100 OR ASTM D854)	[_._ _ _]
* 6.	AGGREGATE COMBINATION (CALCULATED - EQ. 7.1)	[2.7 1 9]

7. EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATION (CALCULATED - EQ. 7.2) _._ _ _

Revised September 18, 1989

SHEET 14

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT COMBINED AGGREGATE PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [6]

* 2. AMOUNT OF UNTREATED AGGREGATE ADDED [6 5.0]
(PERCENT BY WEIGHT OF COMBINED AGGREGATE IN RECYCLED MIX)

* 3. GRADATION OF COMBINED AGGREGATES

Sieve Size or No.	% Passing	Sieve Size or No.	% Passing
2".....	[_ _ _]	No. 4.....	[4 8]
1 1/2".....	[_ _ _]	No. 8.....	[_ _]
1".....	[1 0 0]	No. 10.....	[3 3]
7/8".....	[_ 9 8]	No. 16.....	[_ _]
3/4 ".....	[_ _ _]	No. 30.....	[_ _]
5/8".....	[_ 8 7]	No. 40.....	[2 3]
1/2".....	[_ _ _]	No. 50.....	[_ _]
3/8".....	[7 0]	No. 80.....	[_ 7]
		No. 100.....	[_ _]
		No. 200.....	[_ 2]

BULK SPECIFIC GRAVITIES (Items 4. to 7.)

* 4. COARSE AGGREGATE (AASHTO T85 OR ASTM C127) [_._ _ _]

* 5. FINE AGGREGATE (AASHTO T84 OR ASTM C128) [_._ _ _]

* 6. MINERAL FILLER (AASHTO T100 OR ASTM D854) [_._ _ _]

* 7. AGGREGATE COMBINATION (CALCULATED - EQ. 7.1) [2.6 3 1]

8. EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATION (CALCULATED - EQ. 7.2) _._ _ _

Revised September 18, 1989

SHEET 15

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE GODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
RECLAIMED ASPHALT CEMENT PROPERTIES

* 1.LAYER NUMBER (FROM SHEET 2) [6]

* 2.SPECIFIC GRAVITY OF ASPHALT CEMENT (AASHTO T220 OR ASTM D70) [_._ _ _]

* 3.VISCOSITY OF ASPHALT AT 140°F (POISES) (AASHTO T202 OR ASTM D2171) [_ _ _ _ _ _.]

* 4.VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES) (AASHTO T201 OR ASTM D2170) [_ _ _ _._ _]

* 5.PENETRATION AT 77°F (AASHTO T49 OR ASTM D5) (TENTHS OF A MM) (100 G., 5 SEC.) [_ _ _.]

6.DUCTILITY AT 77°F (CM) (AASHTO T51) _ _ _.

7.DUCTILITY AT 39.2°(CM) (AASHTO T51) _ _ _.

8.TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN) _ _ _.

9.PENETRATION AT 39.2°F (AASHTO T49) (TENTHS OF A MM) (200 G., 60 SEC.) _ _ _.

10.RING AND BALL SOFTENING POINT (AASHTO T53) (°F) _ _ _.

Revised September 18, 1989

SHEET 16

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
NEW ASPHALT CEMENT PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [6]

* 2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [0 2]
(IF OTHER, SPECIFY _____)

* 3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [5 5]
(IF OTHER, SPECIFY _____)

* 4. SPECIFIC GRAVITY OF ASPHALT CEMENT
(AASHTO T228 OR ASTM D70) [0.9 8 5]

* 5. VISCOSITY OF ASPHALT AT 140°F (POISES)
(AASHTO T202 OR ASTM D2171) [_ _ _ _ _ _.]

* 6. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES)
(AASHTO T201 OR ASTM D2170) [_ _ _ _._ _]

* 7. PENETRATION AT 77°F (AASHTO T49 OR ASTM D5)
(TENTHS OF A MM) (100 G., 5 SEC.) [_ _ _.]

8. DUCTILITY AT 77°F (CM)
(AASHTO T51 OR ASTM D113) _ _ _.

9. DUCTILITY AT 39.2°(CM)
(AASHTO T51 OR ASTM D113) _ _ _.

10. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN) _ _ _.

11. PENETRATION AT 39.2°F (AASHTO T49 OR ASTM D5)
(TENTHS OF A MM) (200 G., 60 SEC.) _ _ _.

12. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) _ _ _.

Revised September 18, 1989

SHEET 17

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
COMBINED ASPHALT CEMENT PROPERTIES

* 1.LAYER NUMBER (FROM SHEET 2) [6]

	TYPE	QUANTITY(%)
* 2.RECYCLING AGENT (SEE TYPE CODE, TABLE A.20) (IF OTHER, SPECIFY TYPE _____)	[_ _]	[_ _.]

* 3.AMOUNT OF NEW ASPHALT CEMENT ADDED (PERCENT BY WEIGHT OF RECYCLED MIXTURE WEIGHT) [_ 2.0]

*4.SPECIFIC GRAVITY OF ASPHALT CEMENT (AASHTO T228 OR ASTM D70) [_._ _ _]

* 5.VISCOSITY OF ASPHALT AT 140°F (POISES) (AASHTO T202 OR ASTM D2171) [_ _ _ _ _ _.]

* 6.VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES) (AASHTO T201 OR ASTM D2170) [_ _ _ _._ _]

* 7.PENETRATION AT 77°F (AASHTO T49 OR ASTM D5) (TENTHS OF A MM) (100 G., 5 SEC.) [_ _ _.]

ASPHALT MODIFIERS (SEE TYPE CODE, TABLE A.15) (Items 8. and 9.) (OTHER THAN RECYCLING AGENT)

	TYPE	QUANTIFY(%)
8.MODIFIER #1	[_ _.]	[_ _.]
9.MODIFIER #2	[_ _.]	[_ _.]
(IF OTHER, SPECIFY TYPE _____)		

10.DUCTILITY AT 77°F (CM) (AASHTO T51 OR ASTM D113) _ _ _.

11.DUCTILITY AT 39.2°(CM) (AASHTO T51) _ _ _.

12.TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN) _ _ _.

13.PENETRATION AT 39.2°F (AASHTO T49 OR ASTM D5) (TENTHS OF A MM) (200 G., 60 SEC.) _ _ _.

14.RING AND BALL SOFTENING POINT (AASHTO T53) (°F) _ _ _.

Revised September 18, 1989

*STATE ASSIGNED ID [_ _ _ _]

SHEET 18

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [A 5 0 3]

LTPP PROGRAM

HOT MIX RECYCLED ASPHALT PAVEMENT
LABORATORY AGED COMBINED ASPHALT CEMENT PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [6]

2. TEST PROCEDURE USED TO MEASURE AGING EFFECTS _
   ASTM D1754 - Thin Film Oven Test..... 1
   ASTM D2872 - Rolling Thin Film Oven Test..... 2
   Other (Specify)_____ 3

3. VISCOSITY OF ASPHALT AT 140°F (POISES) _ _ _ _ _ _.
   (AASHTO T202 OR ASTM D2171)

4. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES) _ _ _ _._ _
   (AASHTO T201 OR ASTM D2170)

5. DUCTILITY AT 77°F (CM) (AASHTO T51 OR ASTM D113) _ _ _.

6. DUCTILITY AT 39.2°F (CM) (AASHTO T51 OR ASTM D113) _ _ _.

7. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN) _ _._

8. PENETRATION AT 77°F, 100 G., 5 SEC.
   (TENTHS OF A MM) (AASHTO T49 OR ASTM D5) _ _ _.

9. PENETRATION AT 39.2°F, 200 G., 60 SEC.
   (TENTHS OF A MM) (AASHTO T49 OR ASTM D5) _ _.

10. RING AND BALL SOFTENING POINT (°F) (AASHTO T53) _ _ _.

11. WEIGHT LOSS (PERCENT) _._

Revised September 18, 1989

SHEET 19

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
LABORATORY MIXTURE DESIGN

* 1. LAYER NUMBER (FROM SHEET 2)	[6]
2. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) (EQ. 7.3)	2.514
3. BULK SPECIFIC GRAVITY (ASTM D1188)	2.424
4. OPTIMUM ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX) (AASHTO T164 OR ASTM D2172)	_3.8
5. PERCENT AIR VOIDS (EQ. 7.4)	_3.6
6. MARSHALL STABILITY (LBS) (AASHTO T245 OR ASTM D1559)	_ _ _ _.
7. NUMBER OF BLOWS	_ _.
8. MARSHALL FLOW (HUNDREDTHS OF AN INCH) (AASHTO T245 OR ASTM D1559)	_ _ _ _.
9. HVEEM STABILITY (AASHTO T246 OR ASTM D1561)	_50.
10. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) (AASHTO T246 OR ASTM D1561)	_144.

SHEET 20

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [4 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
MIXTURE PROPERTIES AS PLACED

* 1.LAYER NUMBER (FROM SHEET 2) [6]

* 2.TYPE OF SAMPLES [_]
Mixed in Field, Compacted in Laboratory..... 1
Mixed and Compacted in Field..... 2

* 3.MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) (EQ. 7.3) [_._ _ _]

* 4.BULK SPECIFIC GRAVITY (ASTM D1188)
MEAN .....[_._ _ _] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _._ _ _ MAXIMUM ..... _._ _ _
STD. DEV. .... _._ _ _

* 5.ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX)
(AASHTO T164 OR ASTM D2172)
MEAN .....[_ _._] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. ..... _ _._

* 6.PERCENT AIR VOIDS (EQ. 7.4)
MEAN .....[_ _._] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. ..... _ _._

7.VOIDS IN MINERAL AGGREGATE (PERCENT) (EQ. 7.5)
MEAN .....[_ _._] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. .... _ _._

8.EFFECTIVE ASPHALT CONTENT (PERCENT) (EQ. 7.6)
MEAN .....[_ _._] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. .... _ _._

Revised December 15, 1989

SHEET 21

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 3]

HOT MIX RECYCLED ASPHALT PAVEMENT
MIXTURE PROPERTIES AS PLACED (CONTINUED)

* 1.LAYER NUMBER (FROM SHEET 2) [6]

* 2.TYPE ASPHALT PLANT [2]
Batch Plant..... 1 Drum Mix Plant..... 2
Other (Specify)_____ 3

* 3.TYPE OF ANTISTRIPPING AGENT
(SEE TYPE CODES, TABLE A.21) [7 0]
(OTHER, SPECIFY ADHERE HP PLUS.)

* 4.ANTISTRIPPING AGENT LIQUID OR SOLID CODE [1]
Liquid..... 1 Solid..... 2

* 5. AMOUNT OF ANTISTRIPPING AGENT [_ 1.0]
(If LIQUID, ENTER AMOUNT AS PERCENT OF ASPHALT CEMENT WEIGHT.
IF SOLID, ENTER AMOUNT AS PERCENT OF AGGREGATE WEIGHT.)

6.MOISTURE SUSCEPTIBILITY TEST TYPE 5
AASHTO T165 (ASTM D1075)..... 1
Texas Freeze-Thaw Pedestal Test (Ref 21)..... 2
Texas Boiling Test (Ref 22)..... 3
Revised Lottman Procedure (AASHTO T283)..... 4
Other (Specify) TESTS 2 & 3 w/ 1.0% ANTI STRIP AGENT 5

7.MOISTURE SUSCEPTIBILITY TEST RESULTS
HVEEM STABILITY NO. _ _.
PERCENT STRIPPED 1 0.
TENSILE STRENGTH RATIO (AASHTO T283) 0.7 9
INDEX OF RETAINED STRENGTH (AASHTO T165) _ _ _.

RECEIVED SEP 1 9 1991

TEXAS DEPARTMENT OF TRANSPORTATION
HOT MIX DESIGN

Control: 197-3-49
Project: FR136(24)
Highway: US 175
Item: 340 Ty B
Producer: Brown & Root, Inc.

Engineer: Albert B. Harlan
Lab. No: 18-91-1887

September 13, 1991

HOT MIX DESIGN: ITEM 340 Ty B

Control:	197-3-49	Producer:	Brown & Root Inc.
Project:	FR136(24)		
Highway:	US 175	Design No:	18-91-1887
Engineer:	Albert B. Harlan	Date Reported:	September 13, 1991

MATERIAL IDENTIFICATION

18-91-1888	Ty B Cr Granite	Meridian Aggr.	Mill Creek Ok
18-91-1887	Recycled HMAC	Texas D.O.T.	FM740 & US175
18-91-1889	Ty D Cr Granite	Meridian Aggr.	Mill Creek OK
18-91-1890	Granite Scrns	Meridian Aggr.	Mill Creek Ok
18-91-1891	Field Sand	B&M Sand & Grav.	Seagoville Tx
	AC-5 Asphalt	Total Petroleum	Ardmore Ok
18-91-1887	Adhere HP Plus	Arr Maz	LaPlace La

PHYSICAL PROPERTIES

Material	Property	Design Value	Specs
/ B Cr Granite	Specific Gravity	2.728	
	Absorption	0.2 %	
	Decantation	0.1 %	
Recycled HMAC	Specific Gravity	2.482	
Ty D Cr Granite	Specific Gravity	2.784	
	Absorption	0.4 %	
	Decantation	0.2 %	
Granite Scrns	Specific Gravity	2.674	
	Absorption	0.3 %	
	Decantation	0.5 %	
	Plasticity Index	5	max. 6
Field Sand	Specific Gravity	2.682	
	Plasticity Index	5	max. 6
Coarse Aggr	Polish Value	N/A	N/A
Combined Aggr	Sand Equivalent	68	min 45
AC-5 Asphalt	Specific Gravity	0.985	
dhere HP Plus	Specific Gravity	1.011	

District 18 Laboratory

MEETS

SPECIFICATIONS

AGGREGATE GRADATION

Sieve Sizes	Field Sand	Granite Screenings	Ty D Cr Granite	Recycled HMAC *	Ty B Cr Granite
+ 1"	0.0	0.0	0.0	0.0	0.0
1" - 7/8"	0.0	0.0	0.0	0.0	4.8
7/8" - 5/8"	0.0	0.0	0.0	1.0	34.8
5/8" - 3/8"	0.0	0.0	20.2	4.7	40.4
3/8" - #4	0.0	3.8	66.8	26.4	15.9
#4 - #10	0.0	30.7	11.7	27.3	2.9
+ #10	0.0	34.5	98.7	59.4	98.8
#10 - #40	1.7	40.2	0.4	15.9	0.3
#40 - #80	71.8	11.8	0.1	17.8	0.1
#80 - #200	24.4	6.6	0.2	5.6	0.3
- #200	2.1	6.9	0.6	1.3	0.5

* NOTE: Recycled HMAC included 5.0% asphalt.

PROPOSED DESIGN PERCENTAGES

Aggregate	Design Percentage
Field Sand	12.0
Granite Scrns	10.0
Ty D Cr Granite	10.0
Recycled HMAC	35.0
Ty B Cr Granite	33.0

PROPOSED JOB-MIX FORMULA

Sieve Sizes	Job-Mix Formula	Mixture Tolerances	Specifications
+ 1"	0.0	0	0
1" - 7/8"	1.6 100	0.0 - 5.0	0 - 5
7/8" - 5/8"	11.9 98.4	8.0 - 16.9	8 - 25
5/8" - 3/8"	16.9 86.5	11.9 - 21.9	10 - 30
3/8" - #4	21.5 69.6	16.5 - 26.5	11 - 35
#4 - #10	14.9 48.1	9.9 - 19.9	5 - 26
+ #10	66.8	61.8 - 71.8	58 - 74
#10 - #40	9.9 33.2	6.9 - 12.9	6 - 32
#40 - #80	16.0 23.3	13.0 - 19.0	4 - 21
#80 - #200	5.6 7.3	3.0 - 8.6	3 - 21
- #200	1.7	1.0 - 4.7	1 - 8
Asphalt Content	3.8	3.5 - 4.1	2.0 - 7.0

District 18 Laboratory

MEETS

SPECIFICATIONS

MOLDED SPECIMEN RESULTS

Asph. Added (%)	Total(%) Asphalt Content	Actual Sp Gr	Theor Sp Gr (Corr)	Percent Density	Percent Stability	Cohesio-meter Value	VMA (%)
2.0	3.8	2.424	2.514	96.4	50	144	9.7
3.0	4.8	2.449	2.475	98.9	40	226	9.7
4.0	5.8	2.437	2.437	100.0	17	223	11.1
5.0	6.8	2.435	2.435	100.0	too low	121	12.1
2.0	3.8	2.424	2.514	96.4	50	144	9.7

970 grams for a 2 in. specimen.

STRIP TEST DETERMINATION (OPTIMUM ASPH CONTENT)

Percent Anti-Strip Agent Used	Percent Stripping Tex-530-C	Tensile Strength Ratio Tex-531-C
0.0	55.0	N/A
1.0	10.0	0.79

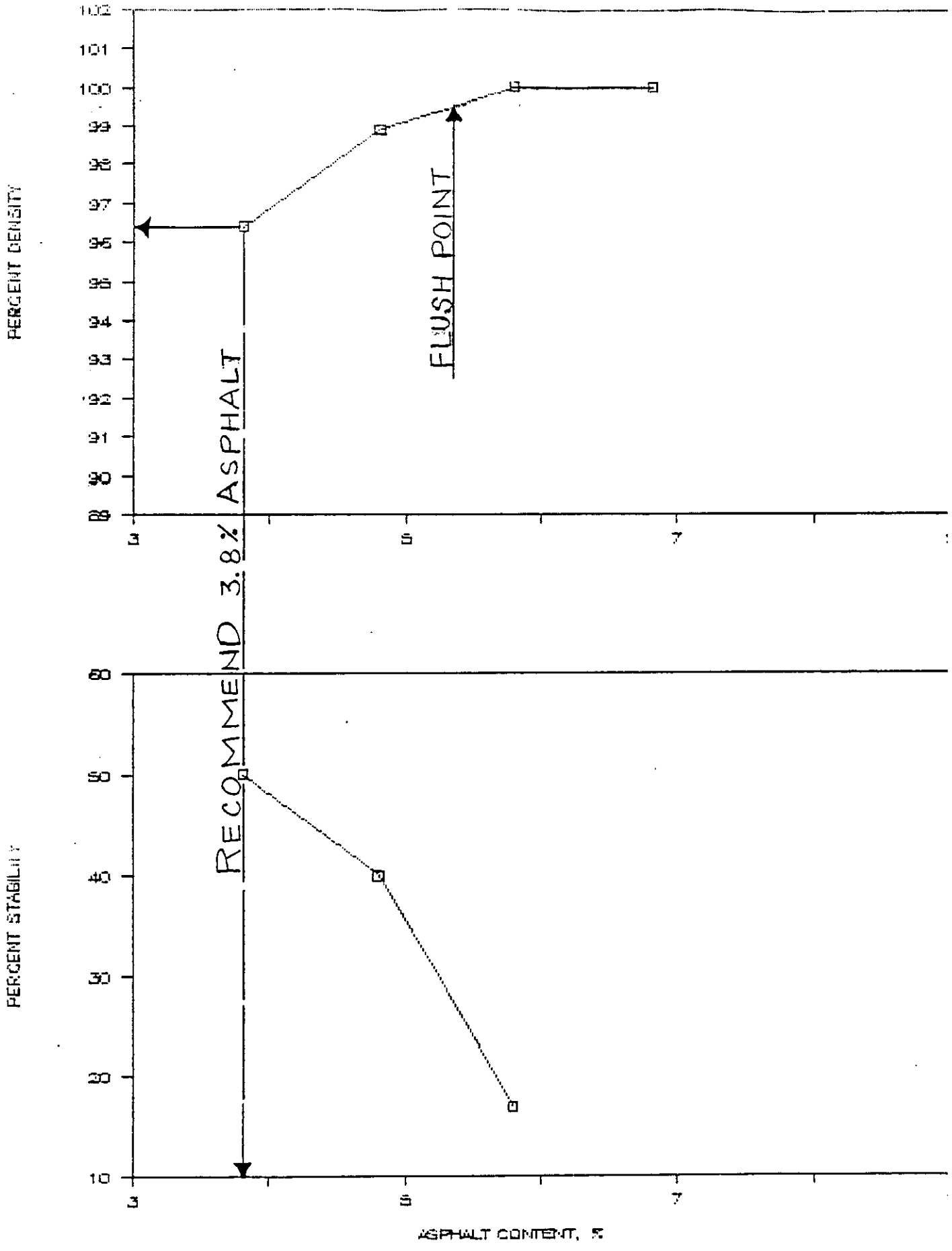
Recommended Percent Anti-strip: 1.0 ** Minimum TSR: 0.70 (spec's)

NOTE: Submit a sample of the completed mix to the District 18 Laboratory on the first day of production for a strip test.

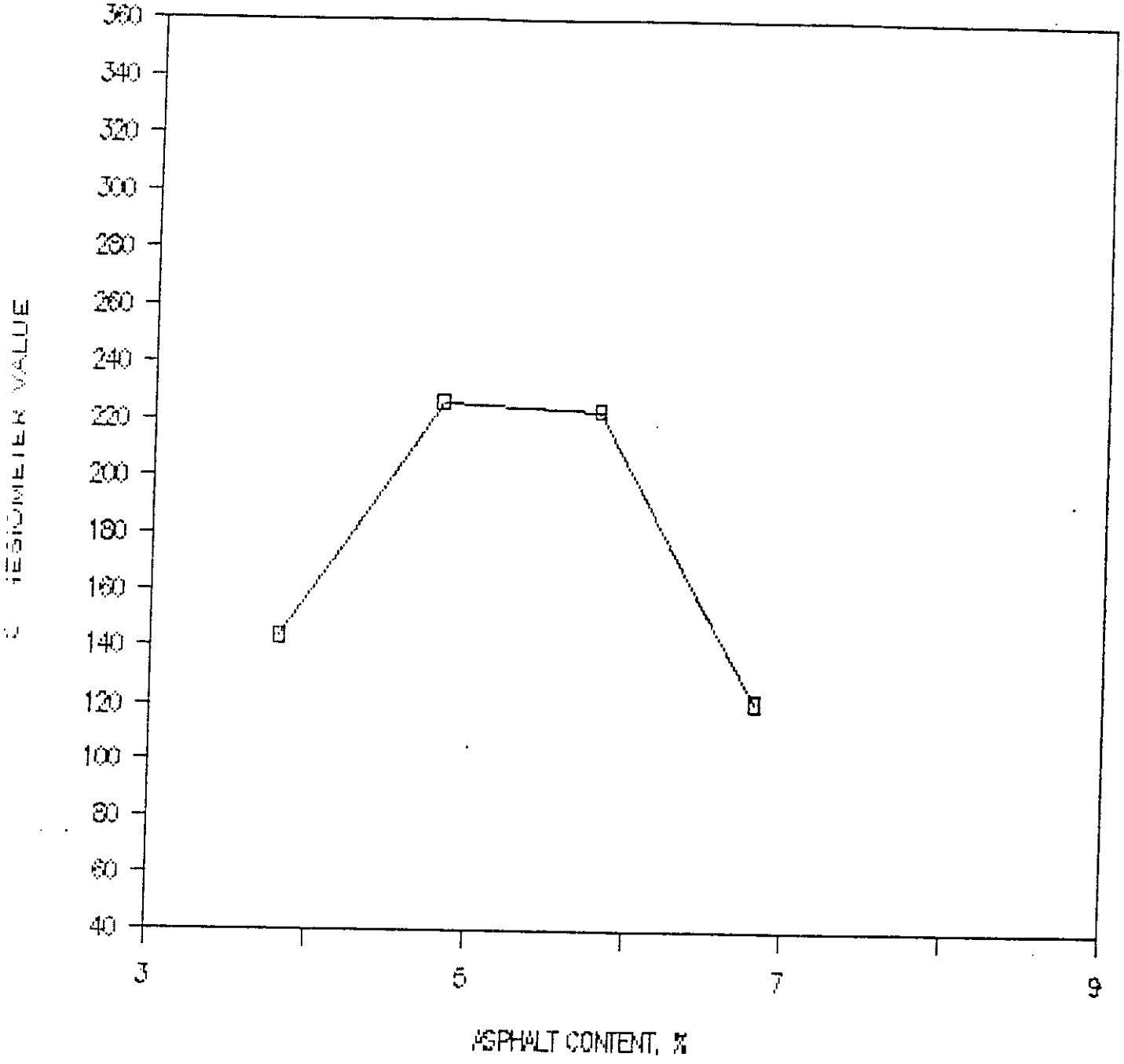
District 18 Laboratory

MEETS

SPECIFICATIONS


PERCENT DENSITY
FLUSH POINT
RECOMMEND 3.8% ASPHALT
PERCENT STABILITY
ASPHALT CONTENT, %

COHESION VS. ASPHALT CONTENT



Revised September 18, 1989

*STATE ASSIGNED ID [_ _ _ _]

SHEET 3

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [A 5 0 4]

LTPP PROGRAM

VIRGIN
ITEM 340
TYPE "C"

ASPHALT CONCRETE OVERLAY AGGREGATE PROPERTIES

* 1.LAYER NUMBER (FROM SHEET 2) [7] (SEE 4BA50 FOR ORIGINAL MIX DESIGN)

COMPOSITION OF COARSE AGGREGATE (Items 2., 3., and 4.)

			TYPE	PERCENT
Crushed Stone... 1	Crushed Slag..... 4	* 2.	[1]	[1 0 0.]
Gravel..... 2	Manufactured	* 3.	[_]	[_ _ _.]
Crushed Gravel.. 3	Lightweight.... 5	* 4.	[_]	[_ _ _.]
Other (Specify)_____ 6				

* 5.GEOLOGIC CLASSIFICATION OF COARSE AGGREGATE [0 7.] 80% TRAPROCK (BASALT) 20% GRANITE.
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE (Items 6., 7., and 8.)

		TYPE	PERCENT
Natural Sand..... 1	* 6.	[2]	[_ 6 2.]
Manufactured Sand (From	* 7.	[1]	[_ 3 8.]
Crushed Gravel or Stone)..... 2	* 8.	[_]	[_ _ _.]
Recycled Concrete..... 3			
Other (Specify)_____ 4			

* 9.TYPE OF MINERAL FILLER [_]

Stone Dust..... 1 Portland Cement... 3
Hydrated Lime..... 2 Fly Ash..... 4
Other (Specify)_____ 5

AGGREGATE DURABILITY TEST RESULTS (Items 10. to 13.)
(SEE DURABILITY TEST TYPE CODES,TABLE A.13)

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
10.	COARSE	_ _	_ _ _._ _ _
11.	COARSE	_ _	_ _ _._ _ _
12.	COARSE	_ _	_ _ _._ _ _
13.	COMBINED COARSE AND FINE	_ _	_ _ _._ _ _

14.POLISH VALUE OF COARSE AGGREGATES 3 6.
(SURFACE LAYER ONLY) (AASHTO T279, ASTM D3319)

SHEET 4

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 4]

ASPHALT CONCRETE OVERLAY
AGGREGATE PROPERTIES (CONTINUED)

* 1. LAYER NUMBER (FROM SHEET 2) [7]

* 2. GRADATION OF COMBINED AGGREGATES

Sieve Size or No.	% Passing	Sieve Size or No.	% Passing
2".....	[_ _ _]	No. 4.....	[5 7]
1 1/2".....	[_ _ _]	No. 8.....	[_ _]
1".....	[1 0 0]	No. 10.....	[4 1]
7/8".....	[_ 9 9]	No. 16.....	[_ _]
3/4 ".....	[_ _ _]	No. 30.....	[_ _]
5/8".....	[_ _ _]	No. 40.....	[2 6]
1/2".....	[_ _ _]	No. 50.....	[_ _]
3/8".....	[7 8]	No. 80.....	[1 0]
		No. 100.....	[_ _]
		No. 200.....	[_ 3]

BULK SPECIFIC GRAVITIES (Items 3. to 6.)

* 3. COARSE AGGREGATE (AASHTO T85 OR ASTM C127) [2.7 8 1]

* 4. FINE AGGREGATE (AASHTO T84 OR ASTM C128) [2.6 5 6]

* 5. MINERAL FILLER (AASHTO T100 OR ASTM D854) [_._ _ _]

* 6. AGGREGATE COMBINATION (CALCULATED - EQ. 7.1) [2.7 1 9]

7. EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATION (CALCULATED - EQ. 7.2) _._ _ _

Revised September 18, 1989

*STATE ASSIGNED ID [_ _ _ _]

SHEET 5

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [A 5 0 4]

LTPP PROGRAM

ASPHALT CONCRETE OVERLAY
ASPHALT CEMENT PROPERTIES

* 1.LAYER NUMBER (FROM SHEET 2) [7]

* 2.ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [0 3]
(IF OTHER, SPECIFY_____)

* 3.SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [6 5]
(IF OTHER, SPECIFY _____)

* 4.SPECIFIC GRAVITY OF ASPHALT CEMENT
(AASHTO T228 OR ASTM D70) [1.0 4 0]

* 5.VISCOSITY OF ASPHALT AT 140°F (POISES)
(AASHTO T202 OR ASTM D2171) [_ _ _ _ _ _.]

* 6.VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES)
(AASHTO T201 OR ASTM D2170) [_ _ _ _._ _]

* 7.PENETRATION AT 77°F (AASHTO T49 OR ASTM D5)
(TENTHS OF A MM) (100 G., 5 SEC.) [_ _ _.]

ASPHALT MODIFIERS (SEE TYPE CODE, TABLE A.15) (Items 8. and 9.)

	TYPE	QUANTITY(%)
* 8. MODIFIER #1	[_ 8.]	[0 3.]
* 9. MODIFIER #2	[_ _.]	[_ _.]

(IF OTHER, SPECIFY TYPE _____)

10.DUCTILITY AT 77°F (CM)
(AASHTO T51 OR ASTM D113) _ _ _.

11.DUCTILITY AT 39.2°(CM)
(AASHTO T51 OR ASTM D113) _ _ _.

12.TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN) _ _ _.

13.PENETRATION AT 39.2°F (AASHTO T49 OR ASTM D5)
(TENTHS OF A MM) (200 G., 60 SEC.) _ _ _.

14.RING AND BALL SOFTENING POINT (AASHTO T53) (°F) _ _ _.

*STATE ASSIGNED ID [_ _ _ _]

SHEET 6

REHABILITATION DATA

LTPP PROGRAM

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 4]

ASPHALT CONCRETE OVERLAY
LABORATORY AGED ASPHALT CEMENT PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [7]

2. TEST PROCEDURE USED TO MEASURE AGING EFFECTS ___
   ASTM D1754 - Thin Film Oven Test..... 1
   ASTM D2872 - Rolling Thin Film Oven Test..... 2
   Other (Specify)_____ 3

3. VISCOSITY OF ASPHALT AT 140°F (POISES) ___ ___ ___ ___ ___ ___.
   (AASHTO T202 OR ASTM D2171)

4. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES) ___ ___ ___ ___.___ ___
   (AASHTO T201 OR ASTM D2170)

5. DUCTILITY AT 77°F (CM) (AASHTO T51 OR ASTM D113) ___ ___ ___.

6. DUCTILITY AT 39.2°F (CM) (AASHTO T51 OR ASTM D113) ___ ___ ___.

7. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN) ___ ___.___

8. PENETRATION AT 77°F, 100 G., 5 SEC.
   (TENTHS OF A MM) (AASHTO T49 OR ASTM D5) ___ ___ ___.

9. PENETRATION AT 39.2°F, 200 G, 60 SEC.
   (TENTHS OF A MM) (AASHTO T49 OR ASTM D5) ___ ___.

10. RING AND BALL SOFTENING POINT (°F) (AASHTO T53) ___ ___ ___.

11. WEIGHT LOSS (PERCENT) ___.___

Revised September 18, 1989

SHEET 7

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [48]

*SHRP SECTION ID [A504]

ASPHALT CONCRETE OVERLAY
LABORATORY MIXTURE DESIGN

* 1. LAYER NUMBER (FROM SHEET 2)	[7]
2. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) (EQ. 7.3)	2.507
3. BULK SPECIFIC GRAVITY (ASTM D1188)	2.432
4. OPTIMUM ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX) (AASHTO T164 OR ASTM D2172)	_5.2
5. PERCENT AIR VOIDS (EQ. 7.4)	_3.0
6. MARSHALL STABILITY (LBS) (AASHTO T245 OR ASTM D1559)	_ _ _ _.
7. NUMBER OF BLOWS	_ _.
8. MARSHALL FLOW (HUNDREDTHS OF AN INCH) (AASHTO T245 OR ASTM D1559)	_ _ _ _.
9. HVEEM STABILITY (AASHTO T246 OR ASTM D1561)	_44.
10. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) (AASHTO T246 OR ASTM D1561)	_190.

*STATE ASSIGNED ID [_ _ _ _]

SHEET 8

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [A 5 0 4]

LTPP PROGRAM

ASPHALT CONCRETE OVERLAY
MIXTURE PROPERTIES AS PLACED

* 1.LAYER NUMBER (FROM SHEET 2) [7]

* 2.TYPE OF SAMPLES [_]
Mixed in Field, Compacted in Laboratory..... 1
Mixed and Compacted in Field 2

* 3.MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) (EQ. 7.3) [_._ _ _]

* 4.BULK SPECIFIC GRAVITY (ASTM D1188)
MEAN .....[_._ _ _] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _._ _ _ MAXIMUM ..... _._ _ _
STD. DEV. .... _._ _ _

* 5.ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX)
(AASHTO T164 OR ASTM D2172)
MEAN .....[_ _._] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. ..... _ _._

* 6.PERCENT AIR VOIDS (EQ. 7.4)
MEAN .....[_ _._] NUMBER TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. ..... _ _._

7.VOIDS IN MINERAL AGGREGATE (PERCENT) (EQ. 7.5)
MEAN ..... _ _._ NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. ..... _ _._

8.EFFECTIVE ASPHALT CONTENT (PERCENT) (EQ. 7.6)
MEAN ..... _ _._ NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _._ MAXIMUM ..... _ _._
STD. DEV. .... _ _._

SHEET 9

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 4]

ASPHALT CONCRETE OVERLAY
MIXTURE PROPERTIES AS PLACED (CONTINUED)

* 1. LAYER NUMBER (FROM SHEET 2) [7]

* 2. TYPE ASPHALT PLANT [2]
Batch Plant ..... 1 Drum Mix Plant 2
Other (Specify)_____ 3

* 3. TYPE OF ANTISTRIPPING AGENT
(SEE TYPE CODES, TABLE A.21) [0 2]
(OTHER, SPECIFY_____)

* 4. ANTISTRIPPING AGENT LIQUID OR SOLID CODE [1]
Liquid ..... 1 Solid 2

* 5. AMOUNT OF ANTISTRIPPING AGENT [_ 1.0]
(IF LIQUID, ENTER AMOUNT AS PERCENT OF ASPHALT CEMENT WEIGHT.
IF SOLID, ENTER AMOUNT AS PERCENT OF AGGREGATE WEIGHT.)

6. MOISTURE SUSCEPTIBILITY TEST TYPE 5
AASHTO T165 (ASTM D1075)..... 1
Texas Freeze-Thaw Pedestal Test (Ref 21)..... 2
Texas Boiling Test (Ref 22)..... 3
Revised Lottman Procedure (AASHTO T283)..... 4
Other (Specify) 2 & 3 w/ 1.0% anti strip agent 5

7. MOISTURE SUSCEPTIBILITY TEST RESULTS
HVEEM STABILITY NO. _ _.
PERCENT STRIPPED _ 0.
TENSILE STRENGTH RATIO (AASHTO T283) 0.68
INDEX OF RETAINED STRENGTH (AASHTO T165) _ _ _.

HOT MIX DESIGN

CONTROL: 0197-03-049

PROJECT: FR 136 (24)

HIGHWAY: US 175

ITEM: 340 Ty C (Polish)

PRODUCER: Brown and Root, Inc.

ENGINEER: Albert B. Harlan

LAB NO.: 18-91-1810

August 15, 1991

VIRGIN

"COARSE GRADED SURFACE COURSE"

Texas Department of Transportation
District 18 Laboratory

****

Control:	197-3-49	Producer:	Brown & Root Inc.
Project:	FR 136(24)		
Highway:	US 175	Material:	Asph Concrete
Engineer:	Albert B. Harlan	Item No :	340 Ty C
Sampler:	***	Date Received:	9-30-91
Lab. No:	18-91-2509	Date Reported:	10-14-91

Reference Design No: Lab No:18-91-1810 (TEAM #7-91541 Dated:8/15/91)

****

MATERIAL IDENTIFICATION

(27%)	Ty C Traprock	Meridian Aggr	Mill Creek Ok
(23%)	Ty D Traprock	Meridian Aggr	Mill Creek Ok
(31%)	Granite Scrns	Meridian Aggr	Mill Creek Ok
(19%)	Field Sand	B&M Sand & Grav	Seagoville Tx
(5.2%)	AC-10 Asphalt **	Fina	Big Spring Tx
see below	Perma Tac Plus	Scan Road	Waco Tx

****
* *
* TEST METHOD TEX-530-C *
* AND TEX-531-C *
* *
****

(%) Anti-Strip Agent Used	(%) Stripping Tex-530-C	Tensile Strength Ratio Tex-531-C
1.0	10.0	0.92

Minimum Tensile Strength Ratio: 0.70 (spec's)

REMARKS: Premixed Hot-Mix Sample from batch mix plant.
Theoretical Sp. Gr. = 2.507 (Tex-227-F)

** Note: AC-10 Asph with 3.0% Latex - Goodyear Rubber (Houston Tx)

District 18 Laboratory
MEETS
SPECIFICATIONS

HOT MIX DESIGN: ITEM 340 Ty C

Control:	0197-03-049	Producer:	Brown and Root, Inc.
Project:	FR 136(24)		
Highway:	US 175	Design No.:	18-91-1810
Engineer:	Albert B. Harlan	Date Reported:	August 15, 1991

MATERIAL IDENTIFICATION

18-91-1811	Ty C Cr Traprock	Meridian Aggr	Mill Creek, OK
18-91-1812	Ty D Cr Traprock	Meridian Aggr	Mill Creek, OK
18-91-1813	Stone Screenings	Meridian Aggr	Mill Creek. OK
18-91-1814	Field Sand	B and M Sand	Seagoville, TX
	AC 10 Asphalt w/ 3% Latex pre-mixed	Fina Petroleum	Big Springs, TX
18-91-1810	Perma Tac Plus	Scan Road	Waco, TX

PHYSICAL PROPERTIES

Material	Property	Design Value		Specs
27% Ty C Cr Traprock Polish Value 36 Blend 80% Traprock & 20% Granite	Specific Gravity	2.813		$B_{SG_{CA}} = \frac{50}{\frac{27}{2.813}+\frac{23}{2.745}} = 2$
	Absorption	0.7	%	
	Decantation	0.5	%	
23% Ty D Cr Traprock Polish Value 36 Blend 80% Traprock & 20% Granite	Specific Gravity	2.745		
	Absorption	0.7	%	
	Decantation	0.3	%	
31% Stone Screenings	Specific Gravity	2.663		$B_{SG_{FA}} = \frac{50}{\frac{31}{2.663}+\frac{19}{2.644}} = 2$
	Absorption	0.7	%	
	Decantation	0.4	%	
	Plasticity Index	1		Max. 6
19% Field Sand	Specific Gravity	2.644		
	Plasticity Index	3		Max. 6
Coarse Aggregate	Polish Value	36		Min. 35
Combined Aggregate	Sand Equivalent	65		Min. 45
AC-10 Asphalt w/ 3% Latex Pre-mixed	Specific Gravity	1.04		
Perma Tac Plus	Specific Gravity	1.047		

District 18 Laboratory MEETS SPECIFICATIONS

AGGREGATE GRADATION

Sieve Sizes	Field Sand	Stone Screenings	Ty D Cr Traprock	Ty C Cr Traprock
+ 1 in.	0.0	0.0	0.0	0.0
+ 7/8 in.	0.0	0.0	0.0	2.9
7/8 in - 3/8 in	0.0	0.0	7.0	71.4
3/8 in - #4	0.9	5.2	58.4	21.7
#4 - #10	1.5	27.4	31.8	2.3
+#10	2.4	32.6	97.2	98.3
#10 - #40	5.8	40.4	1.9	0.6
#40 - #80	65.7	12.7	0.3	0.3
#80 - #200	24.6	8.2	0.2	0.3
- #200	1.5	6.1	0.4	0.5

PROPOSED DESIGN PERCENTAGES

Aggregate	Design Percentage
Field Sand	19
Stone Screenings	31
Ty D Cr Traprock	23
Ty C Cr Traprock	27

PROPOSED JOB-MIX FORMULA

Sieve Sizes	Job-Mix Formula	Mixture Tolerances	Specifications
+ 1 in	0.0	0	0
+ 7/8 in	0.8 100	0 - 5	0 - 5
7/8 in - 3/8 in	20.9 99.2	16.0 - 25.9	16 - 42
3/8 in - #4	21.1 78.3	16.1 - 26.1	11 - 37
#4 - #10	16.7 57.2	11.7 - 21.7	11 - 32
+ #10	59.5	54.5 - 64.5	58 - 74
#10 - #40	14.2 40.5	11.2 - 17.2	6 - 32
#40 - #80	16.5 26.3	13.5 - 19.5	4 - 27
#80 - #200	7.3 9.8	4.3 - 10.3	3 - 27
- #200	2.5	1.0 - 5.5	1 - 8
Asphalt Content	5.2	4.7 - 5.7	3.5 - 7.0

MOLDED SPECIMEN RESULTS

Asphalt Content (%)	Actual Sp. Gr.	Theor Sp Gr	Percent Density	Percent Stability	Cohesio-meter Value	VMA (%)
3.0	2.327	2.592	89.8	43	48	16.9
4.0	2.389	2.552	93.6	45	94	15.6
5.0	2.427	2.514	96.5	44	167	15.1
6.0	2.450	2.477	98.9	42	283	15.2
7.0	2.444	2.441	100.1	Too-Low	210	16.3
5.2	2.432	2.507	97	44	190	15.1

970 grams for a 2 in. specimen.

STRIP TEST DETERMINATION (OPTIMUM ASPH CONTENT)

Percent Anti-Strip Agent Used	Percent Stripping TEX-530-C	Tensile Strength Ratio TEX-531-C
0.0	15	-
1.0	0	0.68

~~Minimum TSR: 0.70 (specs)~~

MATERIAL MEETS SPECIFICATIONS EXCEPT AS NOTED

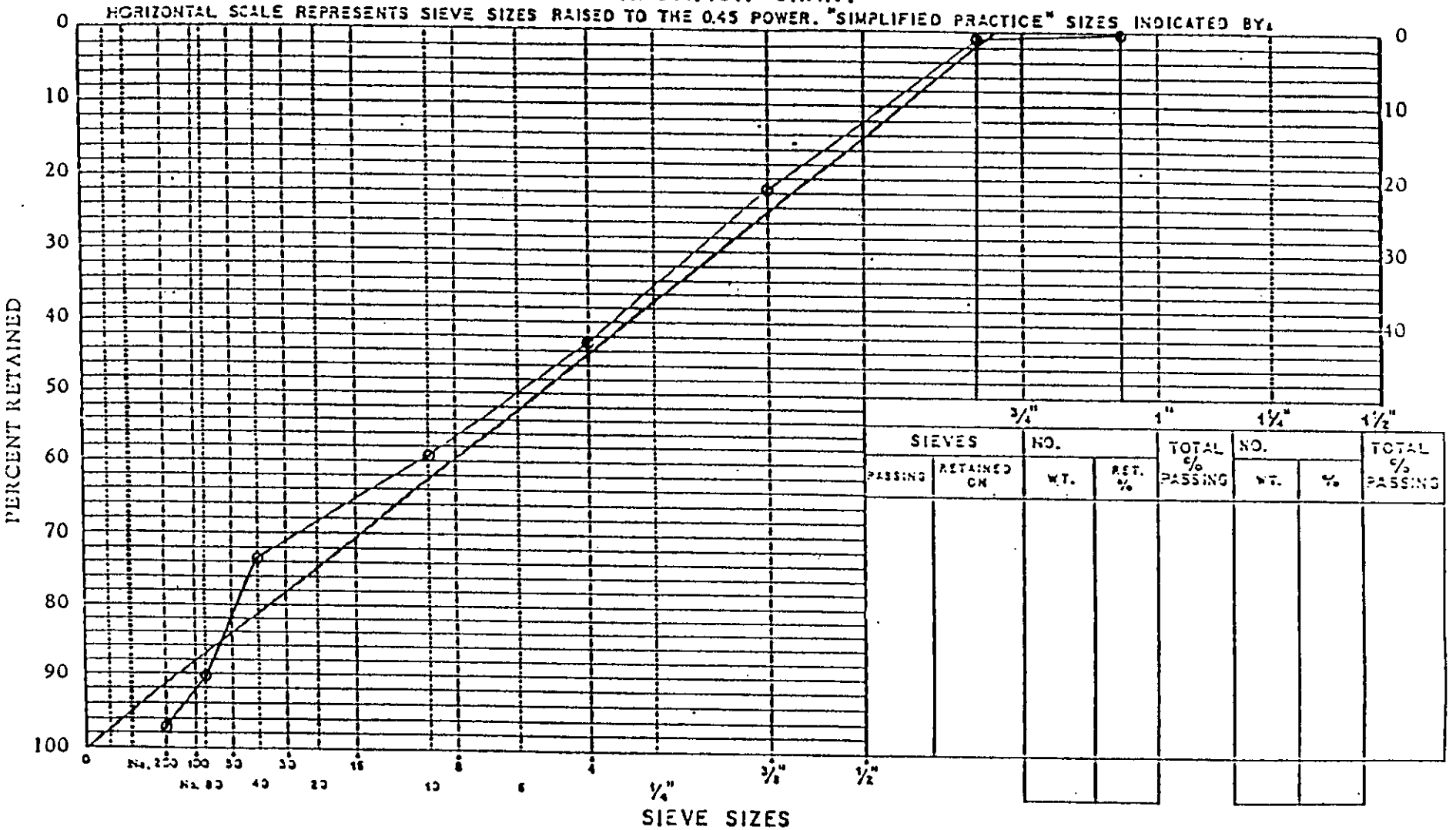
Recommended Percent Anti-strip:

NOTE: Submit a sample of the completed mix to the District Laboratory on the first day of production for a strip test.

HOT - MIX ASPHALT
DESIGN NO : 18-91-1810

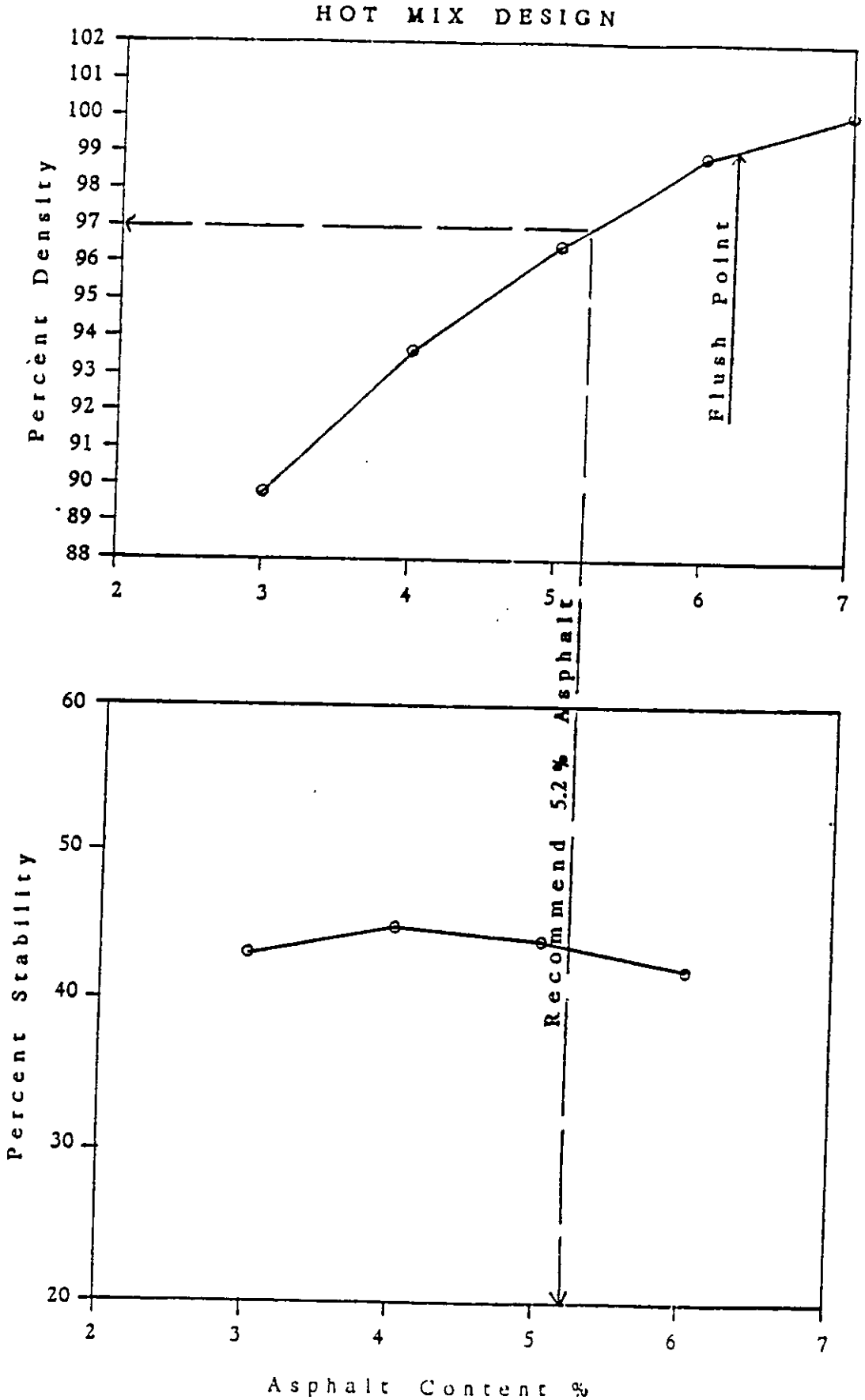
GRADATION CHART

HORIZONTAL SCALE REPRESENTS SIEVE SIZES RAISED TO THE 0.45 POWER. "SIMPLIFIED PRACTICE" SIZES INDICATED BY

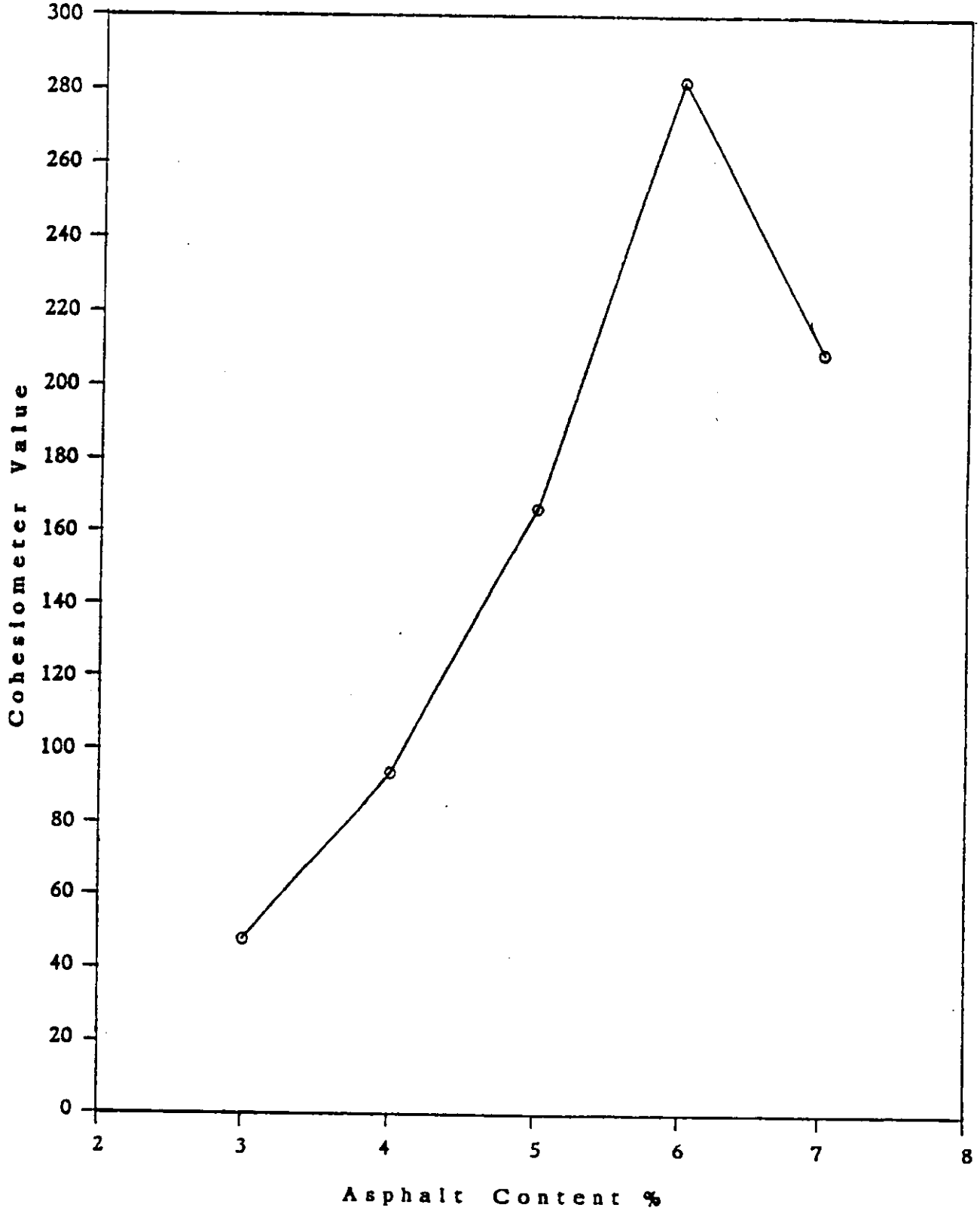


SIEVES		NO.		TOTAL % PASSING	NO.		TOTAL % PASSING
PASSING	RETAINED ON	WT.	RET. %		WT.	%	

SDHPT, 8/15/91
TEAM # 91541
Rpt. #7, Pg. 5 of 7


HOT MIX DESIGN
Percent Density
102
101
100
99
98
97
96
95
94
93
92
91
90
89
88
2
3
4
5
6
7
Flush Point
Recommend 5.2% Asphalt
Percent Stability
60
50
40
30
20
Asphalt Content %

COHESION VS. ASPHALT CONTENT



Revised September 18, 1989

*STATE ASSIGNED ID [_ _ _ _]

SHEET 3

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [A 5 0 4]

LTPP PROGRAM

VIRGIN
ITEM 340
TYPE "B"
" FINE GRADED
LEVEL-UP
(SEE 48A5
FOR ORIGIN
MIX DESIGN

ASPHALT CONCRETE OVERLAY AGGREGATE PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [6]

COMPOSITION OF COARSE AGGREGATE (Items 2., 3., and 4.)

			TYPE	PERCENT
Crushed Stone... 1	Crushed Slag..... 4	* 2.	[1]	[1 0 0.]
Gravel..... 2	Manufactured	* 3.	[_]	[_ _ _.]
Crushed Gravel.. 3	Lightweight.... 5	* 4.	[_]	[_ _ _.]
Other (Specify)_____ 6				

* 5. GEOLOGIC CLASSIFICATION OF COARSE AGGREGATE [0 1.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE (Items 6., 7., and 8.)

		TYPE	PERCENT
Natural Sand..... 1	* 6.	[2]	[_ 6 4.]
Manufactured Sand (From	* 7.	[1]	[_ 3 6.]
Crushed Gravel or Stone)..... 2	* 8.	[_]	[_ _ _.]
Recycled Concrete..... 3			
Other (Specify)_____ 4			

* 9. TYPE OF MINERAL FILLER [_]

Stone Dust..... 1	Portland Cement... 3
Hydrated Lime..... 2	Fly Ash..... 4
Other (Specify)_____ 5	

AGGREGATE DURABILITY TEST RESULTS (Items 10. to 13.)
(SEE DURABILITY TEST TYPE CODES, TABLE A.13)

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
10.	COARSE	_ _	_ _ _._ _ _
11.	COARSE	_ _	_ _ _._ _ _
12.	COARSE	_ _	_ _ _._ _ _
13.	COMBINED COARSE AND FINE	_ _	_ _ _._ _ _

14. POLISH VALUE OF COARSE AGGREGATES _ _.
(SURFACE LAYER ONLY) (AASHTO T279, ASTM D3319)

SHEET 4

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 4]

ASPHALT CONCRETE OVERLAY
AGGREGATE PROPERTIES (CONTINUED)

* 1. LAYER NUMBER (FROM SHEET 2) [6]

* 2. GRADATION OF COMBINED AGGREGATES

Sieve Size or No.	% Passing	Sieve Size or No.	% Passing
2".....	[_ _ _]	No. 4.....	[5 0]
1 1/2".....	[_ _ _]	No. 8.....	[_ _]
1".....	[1 0 0]	No. 10.....	[3 7]
7/8".....	[_ 9 8]	No. 16.....	[_ _]
3/4 ".....	[_ _ _]	No. 30.....	[_ _]
5/8".....	[_ 8 9]	No. 40.....	[2 3]
1/2".....	[_ _ _]	No. 50.....	[_ _]
3/8".....	[7 2]	No. 80.....	[_ 8]
		No. 100.....	[_ _]
		No. 200.....	[_ 2]

BULK SPECIFIC GRAVITIES (Items 3. to 6.)

* 3. COARSE AGGREGATE (AASHTO T85 OR ASTM C127) [2.6 9 3]

* 4. FINE AGGREGATE (AASHTO T84 OR ASTM C128) [2.6 5 4]

* 5. MINERAL FILLER (AASHTO T100 OR ASTM D854) [_._ _ _]

* 6. AGGREGATE COMBINATION (CALCULATED - EQ. 7.1) [2.6 7 4]

7. EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATION (CALCULATED - EQ. 7.2) _._ _ _

Revised September 18, 1989

*STATE ASSIGNED ID [_ _ _ _]

SHEET 5

REHABILITATION DATA

LTPP PROGRAM

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 4]

ASPHALT CONCRETE OVERLAY
ASPHALT CEMENT PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [6]

* 2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [0 3]
(IF OTHER, SPECIFY _____)

* 3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [6 5]
(IF OTHER, SPECIFY _____)

* 4. SPECIFIC GRAVITY OF ASPHALT CEMENT
(AASHTO T228 OR ASTM D70) [1.0 4 0]

* 5. VISCOSITY OF ASPHALT AT 140°F (POISES)
(AASHTO T202 OR ASTM D2171) [_ _ _ _ _ _.]

* 6. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES)
(AASHTO T201 OR ASTM D2170) [_ _ _ _._ _]

* 7. PENETRATION AT 77°F (AASHTO T49 OR ASTM D5)
(TENTHS OF A MM) (100 G., 5 SEC.) [_ _ _.]

ASPHALT MODIFIERS (SEE TYPE CODE, TABLE A.15) (Items 8. and 9.)

		TYPE	QUANTITY(%)
* 8.	MODIFIER #1	[_ 8.]	[0 3.]
* 9.	MODIFIER #2	[_ _.]	[_ _.]

(IF OTHER, SPECIFY TYPE _____)

10. DUCTILITY AT 77°F (CM)
(AASHTO T51 OR ASTM D113) _ _ _.

11. DUCTILITY AT 39.2°(CM)
(AASHTO T51 OR ASTM D113) _ _ _.

12. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN) _ _ _.

13. PENETRATION AT 39.2°F (AASHTO T49 OR ASTM D5)
(TENTHS OF A MM) (200 G., 60 SEC.) _ _ _.

14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) _ _ _.

*STATE ASSIGNED ID [_ _ _ _]

SHEET 6

REHABILITATION DATA

LTPP PROGRAM

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 4]

ASPHALT CONCRETE OVERLAY
LABORATORY AGED ASPHALT CEMENT PROPERTIES

* 1. LAYER NUMBER (FROM SHEET 2) [6]

2. TEST PROCEDURE USED TO MEASURE AGING EFFECTS ___
   ASTM D1754 - Thin Film Oven Test..... 1
   ASTM D2872 - Rolling Thin Film Oven Test..... 2
   Other (Specify)_____ 3

3. VISCOSITY OF ASPHALT AT 140°F (POISES) ___ ___ ___ ___ ___ ___.
   (AASHTO T202 OR ASTM D2171)

4. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES) ___ ___ ___ ___.___ ___
   (AASHTO T201 OR ASTM D2170)

5. DUCTILITY AT 77°F (CM) (AASHTO T51 OR ASTM D113) ___ ___ ___.

6. DUCTILITY AT 39.2°F (CM) (AASHTO T51 OR ASTM D113) ___ ___ ___.

7. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F (CM/MIN) ___ ___.___

8. PENETRATION AT 77°F, 100 G., 5 SEC.
   (TENTHS OF A MM) (AASHTO T49 OR ASTM D5) ___ ___ ___.

9. PENETRATION AT 39.2°F, 200 G, 60 SEC.
   (TENTHS OF A MM) (AASHTO T49 OR ASTM D5) ___ ___.

10. RING AND BALL SOFTENING POINT (°F) (AASHTO T53) ___ ___ ___.

11. WEIGHT LOSS (PERCENT) ___.___

Revised September 18, 1989

SHEET 7

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 4]

ASPHALT CONCRETE OVERLAY
LABORATORY MIXTURE DESIGN

* 1. LAYER NUMBER (FROM SHEET 2)	[6]
2. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) (EQ. 7.3)	2.505
3. BULK SPECIFIC GRAVITY (ASTM D1188)	2.405
4. OPTIMUM ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX) (AASHTO T164 OR ASTM D2172)	4.8
5. PERCENT AIR VOIDS (EQ. 7.4)	4.0
6. MARSHALL STABILITY (LBS) (AASHTO T245 OR ASTM D1559)	_ _ _ _.
7. NUMBER OF BLOWS	_ _.
8. MARSHALL FLOW (HUNDREDTHS OF AN INCH) (AASHTO T245 OR ASTM D1559)	_ _ _ _.
9. HVEEM STABILITY (AASHTO T246 OR ASTM D1561)	44.
10. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) (AASHTO T246 OR ASTM D1561)	190.

Revised December 15, 1989

*STATE ASSIGNED ID [_ _ _ _]

SHEET 8

*STATE CODE [48]

REHABILITATION DATA

*SHRP SECTION ID [A504]

LTPP PROGRAM

ASPHALT CONCRETE OVERLAY
MIXTURE PROPERTIES AS PLACED

* 1.LAYER NUMBER (FROM SHEET 2) [6]

* 2.TYPE OF SAMPLES [_]
Mixed in Field, Compacted in Laboratory..... 1
Mixed and Compacted in Field 2

* 3.MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) (EQ. 7.3) [_._ _ _]

* 4.BULK SPECIFIC GRAVITY (ASTM D1188)
MEAN .....[_._ _ _] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _._ _ _ MAXIMUM ..... _._ _ _
STD. DEV. .... _._ _ _

* 5.ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX)
(AASHTO T164 OR ASTM D2172)
MEAN .....[_ _.__] NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _.__ MAXIMUM ..... _ _.__
STD. DEV. ..... _ _.__

* 6.PERCENT AIR VOIDS (EQ. 7.4)
MEAN .....[_ _.__] NUMBER TESTS ..... _ _.
MINIMUM ..... _ _.__ MAXIMUM ..... _ _.__
STD. DEV. ..... _ _.__

7.VOIDS IN MINERAL AGGREGATE (PERCENT) (EQ. 7.5)
MEAN ..... _ _.__ NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _.__ MAXIMUM ..... _ _.__
STD. DEV. ..... _ _.__

8.EFFECTIVE ASPHALT CONTENT (PERCENT) (EQ. 7.6)
MEAN ..... _ _.__ NUMBER OF TESTS ..... _ _.
MINIMUM ..... _ _.__ MAXIMUM ..... _ _.__
STD. DEV. .... _ _.__

*STATE ASSIGNED ID [_ _ _ _]

SHEET 9

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [A 5 0 4]

LTPP PROGRAM

ASPHALT CONCRETE OVERLAY
MIXTURE PROPERTIES AS PLACED (CONTINUED)

* 1.LAYER NUMBER (FROM SHEET 2) [6]

* 2.TYPE ASPHALT PLANT [2]
Batch Plant ..... 1 Drum Mix Plant 2
Other (Specify)_____ 3

* 3.TYPE OF ANTISTRIPPING AGENT
(SEE TYPE CODES, TABLE A.21) [0 2]
(OTHER, SPECIFY_____)

* 4.ANTISTRIPPING AGENT LIQUID OR SOLID CODE [1]
Liquid ..... 1 Solid 2

* 5. AMOUNT OF ANTISTRIPPING AGENT [_ 1.0]
(IF LIQUID, ENTER AMOUNT AS PERCENT OF ASPHALT CEMENT WEIGHT.
IF SOLID, ENTER AMOUNT AS PERCENT OF AGGREGATE WEIGHT.)

6.MOISTURE SUSCEPTIBILITY TEST TYPE 5
AASHTO T165 (ASTM D1075)..... 1
Texas Freeze-Thaw Pedestal Test (Ref 21)..... 2
Texas Boiling Test (Ref 22)..... 3
Revised Lottman Procedure (AASHTO T283)..... 4
Other (Specify) 2&3 w/ 1.0% anti strip agent 5

7.MOISTURE SUSCEPTIBILITY TEST RESULTS
HVEEM STABILITY NO. _ _.
PERCENT STRIPPED _ 0.
TENSILE STRENGTH RATIO (AASHTO T283) 0.66
INDEX OF RETAINED STRENGTH (AASHTO T165) _ _ _.

RECEIVED NOV 2 2 1991

HOT MIX DESIGN

CONTROL: 0197-03-049

PROJECT: FR 136 (24)

HIGHWAY: US 175

ITEM: 340 Ty B

PRODUCER: Brown and Root, Inc.

ENGINEER: Albert B. Harlan

LAB NO.: 18-91-1805

August 12, 1991

VIRGIN

"FINE GRADED LEVEL-UP COURSE"

Texas Department of Transportation
istrict 18 Laboratory

****

Control:	197-3-49	Producer:	Brown & Root Inc.
Project:	FR 136(24)		
Highway:	US 175	Material:	Asph Concrete
Engineer:	Albert B. Harlan	Item No :	340 Ty B
Sampler:	***	Date Received:	9-30-91
Lab. No:	18-91-2508	Date Reported:	10-14-91

Reference Design No: Lab No:18-91-1805 (TEAM #6-91541 Dated:8/12/91)

****

MATERIAL IDENTIFICATION

(23%)	Ty 6 Granite	Meridian Aggr	Mill Creek Ok
(30%)	Ty D Granite	Meridian Aggr	Mill Creek Ok
(30%)	Granite Scrns	Meridian Aggr	Mill Creek Ok
(17%)	Field Sand	B&M Sand & Grav	Seagoville Tx
(4.8%)	AC-10 Asphalt **	Fina	Big Spring Tx
see below	Perma Tac Plus	Scan Road	Waco Tx

****
* *
* TEST METHOD TEX-530-C *
* AND TEX-531-C *
* *
****

(%) Anti-Strip Agent Used	(%) Stripping Tex-530-C	Tensile Strength Ratio Tex-531-C
1.0	15.0	0.82

Minimum Tensile Strength Ratio: 0.70 (spec's)

REMARKS: Premixed Hot-Mix Sample from batch mix plant.
Theoretical Sp. Gr. = 2.505 (Tex-227-F)

** Note: AC-10 Asph with 3.0% Latex - Goodyear Rubber (Houston Tx)

MATERIAL MEETS
SPECIFICATIONS
EXCEPT AS

Dist

HOT MIX DESIGN: ITEM 340 Ty B

Control:	0197-03-049	Producer:	Brown and Root, Inc.
Project:	FR 136(24)		
Highway:	US 175	Design No.:	18-91-1805
Engineer:	Albert B. Harlan	Date Reported:	August 12, 1991

MATERIAL IDENTIFICATION

18-91-1806	Ty B Cr. Granite	Meridian Aggr	Mill Creek, OK
18-91-1807	Ty D Cr. Granite	Meridian Aggr	Mill Creek, OK
18-91-1808	Stone Screenings	Meridian Aggr	Mill Creek. OK
18-91-1809	Field Sand	B and M Sand	Seagoville, TX
	AC 10 Asphalt	Fina Petroleum	Big Springs, TX
	3% Latex pre-mixed		
18-91-1805	Perma Tac Plus	Scan Road	Waco, TX

PHYSICAL PROPERTIES

	Material	Property	Design Value		Specs
23	Ty B Cr Granite	Specific Gravity	2.724		
		Absorption	0.4	%	
		Decantation	0.2	%	
30	Ty D Cr Granite	Specific Gravity	2.669		
		Absorption	0.6	%	
		Decantation	0.6	%	
0	Stone Screenings	Specific Gravity	2.662		
		Absorption	0.7	%	
		Decantation	0.5	%	
		Plasticity Index	1		Max. 6
17	Field Sand	Specific Gravity	2.640		
		Plasticity Index	3		Max. 6
		Sand Equivalent	68		Min. 45
	AC-10 Asphalt w/ 3% Latex Pre-mixed	Specific Gravity	1.04		
	Perma Tac Plus	Specific Gravity	1.047		

District 18 Laboratory

MEETS

SPECIFICATIONS

AGGREGATE GRADATION

Sieve Sizes	Field Sand	Stone Screenings	Ty D Cr Granite	Ty B Cr Granite
+ 1 In	0.0	0.0	0.0	0.0
1 in - 7/8	0.0	0.0	0.0	8.5
7/8 in - 5/8	0.0	0.0	0.0	39.8
5/8 in - 3/8 in	0.0	0.0	20.1	45.5
3/8 in - #4	1.3	5.2	66.1	5.3
#4 - #10	2.5	28.4	13.3	0.5
+#10	3.8	33.6	99.5	99.6
#10 - #40	7.8	39.5	0.0	0.0
#40 - #80	68.2	13.1	0.0	0.0
#80 - #200	18.8	8.6	0.1	0.1
- #200	1.4	5.2	0.4	0.3

PROPOSED DESIGN PERCENTAGES

Aggregate	Design Percentage
Field Sand	17
Stone Screenings	30
Ty D Cr Granite	30
Ty B Cr Granite	23

PROPOSED JOB-MIX FORMULA

Sieve Sizes	Job-Mix Formula		Mixture Tolerances	Specifications
+ 1 In	0		0	0
1 in - 7/8 in	2.0	100.0	0.0 - 5.0	0 - 5
7/8 in - 5/8 in	9.1	98.0	8.0 - 14.1	8 - 25
5/8 in - 3/8 in	16.5	88.9	11.5 - 21.5	10 - 30
3/8 in - #4	22.8	72.4	17.8 - 27.8	11 - 35
#4 - #10	13.0	49.6	8.0 - 18.0	5 - 26
+ #10	63.4		58.4 - 68.4	58 - 74
#10 - #40	13.2	36.6	10.2 - 16.2	6 - 32
#40 - #80	15.5	23.4	12.5 - 18.5	4 - 21
#80 - #200	5.8	7.9	3.0 - 8.8	3 - 21
- #200	2.1		1.0 - 5.1	1 - 8
Asphalt Content	4.8		4.3 - 5.3	3.5 - 7.0

MOLDED SPECIMEN RESULTS

Asphalt Content (%)	Actual Sp. Gr.	Theor Sp Gr (Corr)	Percent Density	Percent Stability	Cohesiometer Value	VMA (%)
3.0	2.336	2.573	90.8	42	73	15.3
4.0	2.388	2.535	94.2	46	165	14.3
5.0	2.408	2.497	96.4	44	195	14.4
6.0	2.430	2.461	98.7	43	291	14.6
7.0	2.426	2.426	100.0	25	186	15.6
4.8	2.405	2.505	96.0	44	190	14.4

960 grams for a 2 in. specimen.

STRIP TEST DETERMINATION (OPTIMUM ASPH CONTENT)

Percent Anti-Strip Agent Used	Percent Stripping TEX-530-C	Tensile Strength Ratio TEX-531-C
0.0	15	-
1.0	0	66

Recommended Percent Anti-strip: 1.0

NOTE: Submit a sample of the completed mix to the District Laboratory on the first day of production for a strip test.

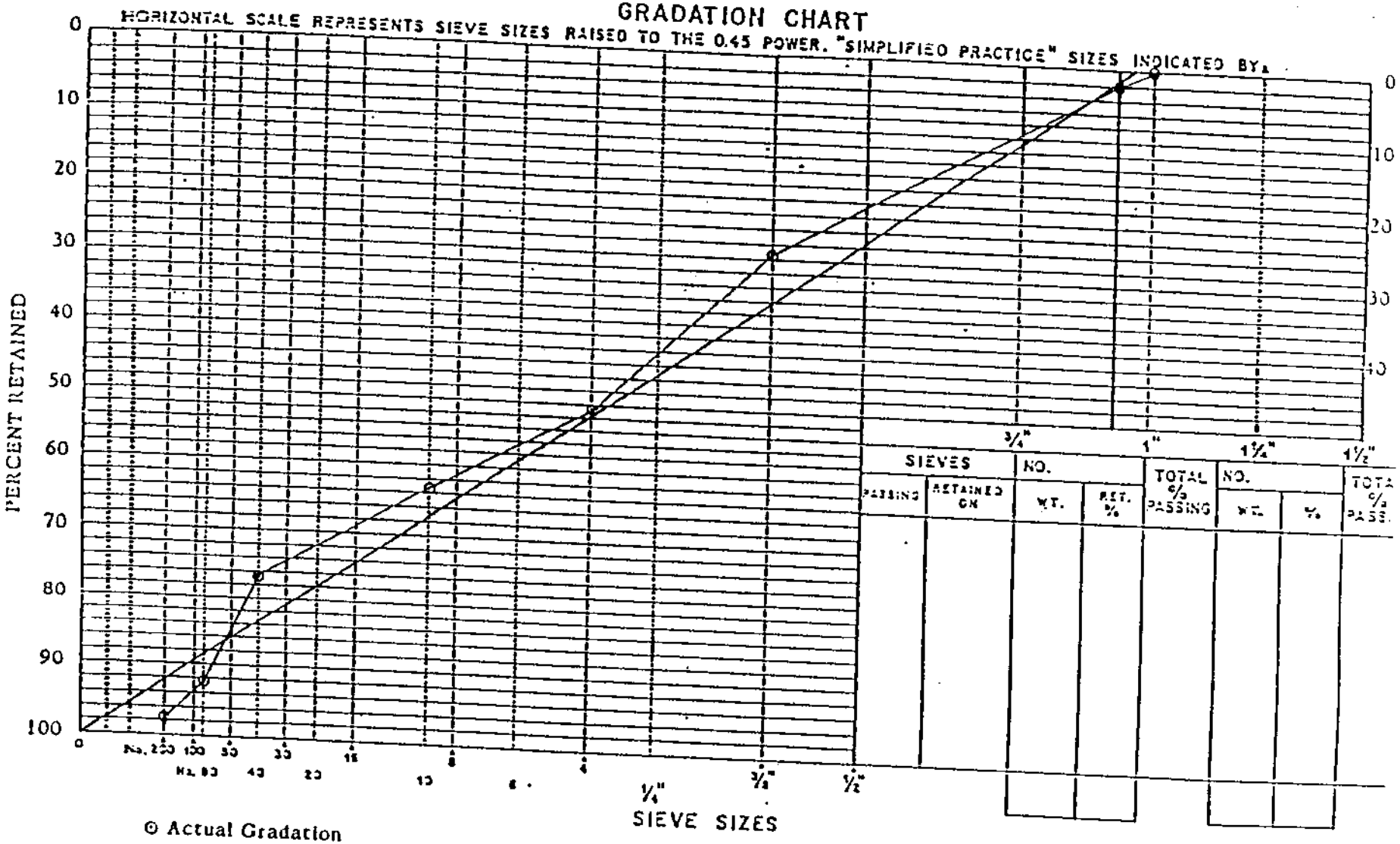
MATERIAL MEETS SPECIFICATIONS
EXCEPTION
District 18 Labora

HOT - MIX ASPHALT DESIGN

O. : 18-91-1805

GRADATION CHART

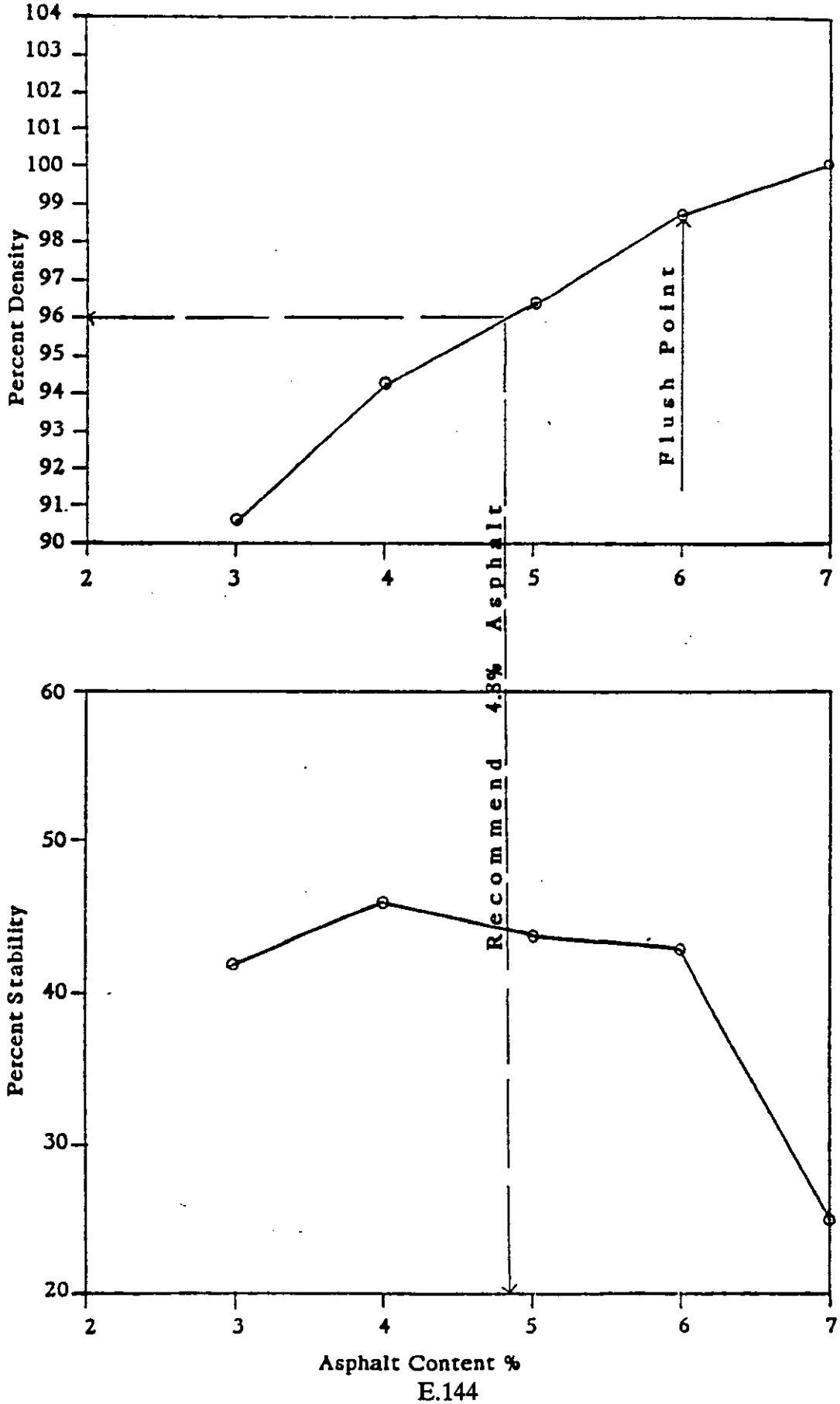
HORIZONTAL SCALE REPRESENTS SIEVE SIZES RAISED TO THE 0.45 POWER. "SIMPLIFIED PRACTICE" SIZES INDICATED BY ▲



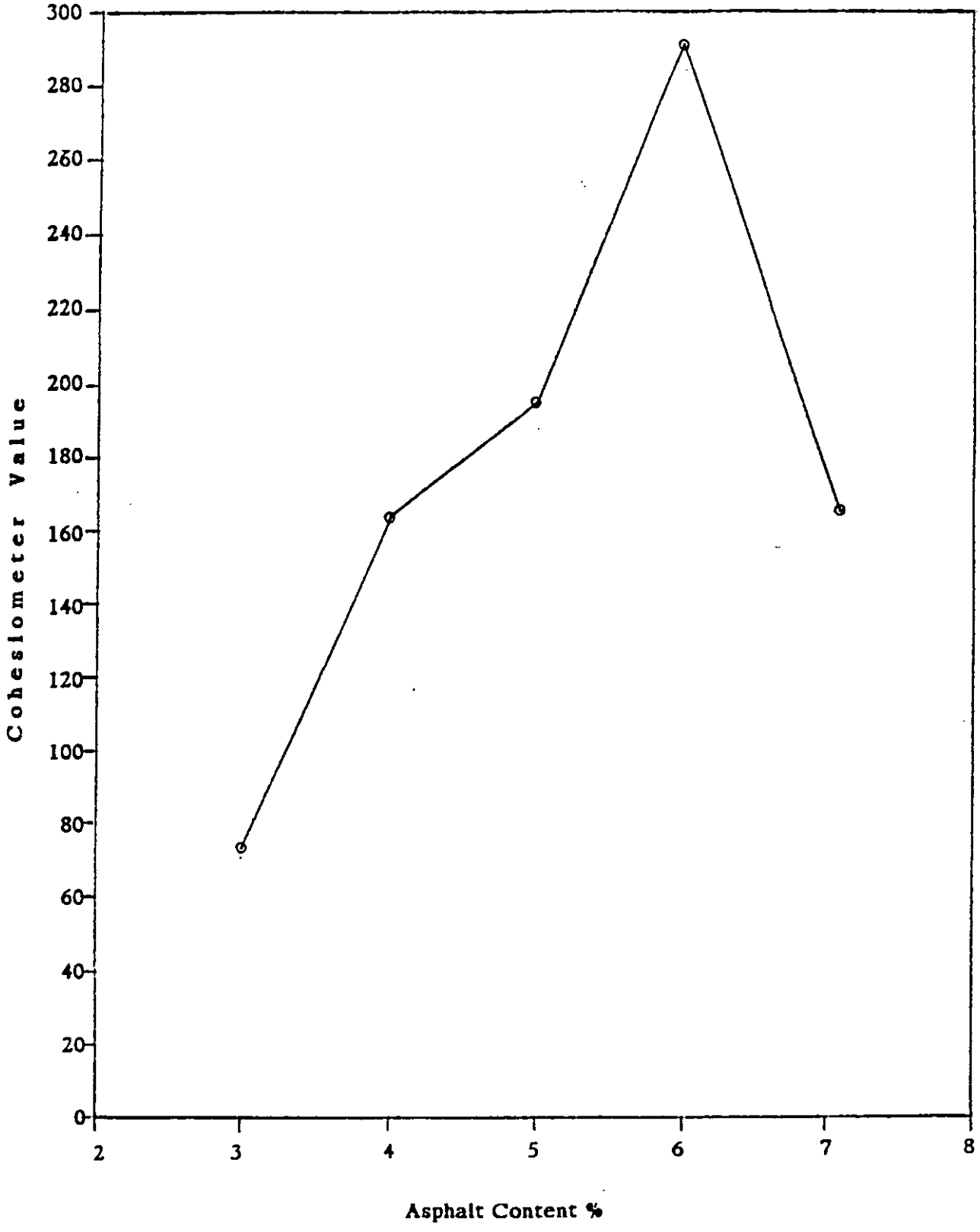
SIEVES		NO.		TOTAL % PASSING	NO.		TOTAL % PASS.
PASSING	RETAINED ON	WT.	RET. %		WT.	%	
				¾"	1"	1¼"	1½"

SDHPT, 8/12/91
TEAM # 91541
Rpt. #6, Pg. 5 of 7

HOT MIX DESIGN



COHESION VS. ASPHALT CONTENT



*STATE ASSIGNED ID	[_ _ _ _]
*STATE CODE	[4 8]
*SHRP SECTION ID	[A 5 0 2]

SHEET 61

REHABILITATION DATA

LTPP PROGRAM

RESTORATION OF AC SHOULDERS

* 1. SHOULDER RESTORED [3]
- Outside 1
- Inside 2
- Both 3

		INSIDE SHOULDER	OUTSIDE SHOULDER
* 2.	SURFACE TYPE (CODES-TABLE A.5)	1	[1]
* 3.	TOTAL WIDTH (FEET)	1 0.	[1 8.]
* 4.	PAVED WIDTH (FEET)	1 0.	[1 5.]
* 5.	SHOULDER BASE TYPE (CODES-TABLE A.6)	2 3	[2 3]
* 6.	SURFACE THICKNESS (INCHES)	1.5	[9.5]
* 7.	BASE THICKNESS (INCHES)	13.5	[13.5]

* 8. TYPE OF SHOULDER RESTORATION [1]
- AC Overlay Without Removal of Existing AC..... 1
- Cold Milling and AC Overlay..... 2
- Complete Shoulder Removal and Replacement..... 3
- In-place Recycling and Overlay..... 4
- Other (Specify)_____ 5

* 9. TYPE OF AC MATERIALS [2]
- New Materials..... 1
- Hot Recycled Materials..... 2
- Cold Recycled Materials..... 3
- Other (Specify)_____ 4

*10. THICKNESS OF AC MATERIAL REMOVED BY COLD MILLING (IN) [0.0]

*11. AC OVERLAY THICKNESS (IN) [2.0]

12. LANE/SHOULDER JOINT SEALANT [1]
- None..... 1
- Sealed Without Providing Reservoir..... 2
- Saw Reservoir and Seal..... 3
- Other (Specify)_____ 4

13. LANE/SHOULDER JOINT SEALANT RESERVOIR
- WIDTH (INCHES) 0.0
- DEPTH (INCHES) 0.0

14. TYPE OF JOINT SEALANT N
- Poured..... 1
- Preformed..... 2

NOTE: DATA ITEMS 8. TO 14. PERTAIN ONLY TO THE RESTORED OUTSIDE SHOULDER.

*STATE ASSIGNED ID [_ _ _ _]

SHEET 61

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [A 5 0 3]

LTPP PROGRAM

RESTORATION OF AC SHOULDERS

* 1. SHOULDER RESTORED [3]
- Outside 1
- Inside 2
- Both 3

		INSIDE SHOULDER	OUTSIDE SHOULDER
* 2.	SURFACE TYPE (CODES-TABLE A.5)	1	[1]
* 3.	TOTAL WIDTH (FEET)	10.	[18.]
* 4.	PAVED WIDTH (FEET)	10.	[15.]
* 5.	SHOULDER BASE TYPE (CODES-TABLE A.6)	23	[23]
* 6.	SURFACE THICKNESS (INCHES)	1.5	[9.5]
* 7.	BASE THICKNESS (INCHES)	13.5	[13.5]

* 8. TYPE OF SHOULDER RESTORATION [1]
- AC Overlay Without Removal of Existing AC..... 1
- Cold Milling and AC Overlay..... 2
- Complete Shoulder Removal and Replacement..... 3
- In-place Recycling and Overlay..... 4
- Other (Specify)_____ 5

* 9. TYPE OF AC MATERIALS [2]
- New Materials..... 1
- Hot Recycled Materials..... 2
- Cold Recycled Materials..... 3
- Other (Specify)_____ 4

*10. THICKNESS OF AC MATERIAL REMOVED BY COLD MILLING (IN) [0.0]

*11. AC OVERLAY THICKNESS (IN) [5.0]

12. LANE/SHOULDER JOINT SEALANT [1]
- None..... 1
- Sealed Without Providing Reservoir..... 2
- Saw Reservoir and Seal..... 3
- Other (Specify)_____ 4

13. LANE/SHOULDER JOINT SEALANT RESERVOIR
- WIDTH (INCHES) 0.0
- DEPTH (INCHES) 0.0

14. TYPE OF JOINT SEALANT N
- Poured..... 1
- Preformed..... 2

NOTE: DATA ITEMS 8. TO 14. PERTAIN ONLY TO THE RESTORED OUTSIDE SHOULDER.

SHEET 61

REHABILITATION DATA

LTPP PROGRAM

*STATE ASSIGNED ID [_ _ _ _]

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 4]

RESTORATION OF AC SHOULDERS

* 1. SHOULDER RESTORED [3]
- Outside 1
- Inside 2
- Both 3

		INSIDE SHOULDER	OUTSIDE SHOULDER
* 2.	SURFACE TYPE (CODES-TABLE A.5)	1	[1]
* 3.	TOTAL WIDTH (FEET)	10.	[18.]
* 4.	PAVED WIDTH (FEET)	10.	[15.]
* 5.	SHOULDER BASE TYPE (CODES-TABLE A.6)	23	[23]
* 6.	SURFACE THICKNESS (INCHES)	1.5	[9.5]
* 7.	BASE THICKNESS (INCHES)	13.5	[13.5]

* 8. TYPE OF SHOULDER RESTORATION [1]
- AC Overlay Without Removal of Existing AC..... 1
- Cold Milling and AC Overlay..... 2
- Complete Shoulder Removal and Replacement..... 3
- In-place Recycling and Overlay..... 4
- Other (Specify)_____ 5

* 9. TYPE OF AC MATERIALS [1]
- New Materials..... 1
- Hot Recycled Materials..... 2
- Cold Recycled Materials..... 3
- Other (Specify)_____ 4

*10. THICKNESS OF AC MATERIAL REMOVED BY COLD MILLING (IN) [0.0]

*11. AC OVERLAY THICKNESS (IN) [5.0]

12. LANE/SHOULDER JOINT SEALANT [1]
- None..... 1
- Sealed Without Providing Reservoir..... 2
- Saw Reservoir and Seal..... 3
- Other (Specify)_____ 4

13. LANE/SHOULDER JOINT SEALANT RESERVOIR
- WIDTH (INCHES) 0.0
- DEPTH (INCHES) 0.0

14. TYPE OF JOINT SEALANT 2
- Poured..... 1
- Preformed..... 2

NOTE: DATA ITEMS 8. TO 14. PERTAIN ONLY TO THE RESTORED OUTSIDE SHOULDER.

SHEET 61

REHABILITATION DATA

LTPP PROGRAM

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 5]

RESTORATION OF AC SHOULDERS

* 1. SHOULDER RESTORED [3]
- Outside 1
- Inside 2
- Both 3

		INSIDE SHOULDER	OUTSIDE SHOULDER
* 2.	SURFACE TYPE (CODES-TABLE A.5)	1	[1]
* 3.	TOTAL WIDTH (FEET)	10.	[18.]
* 4.	PAVED WIDTH (FEET)	10.	[15.]
* 5.	SHOULDER BASE TYPE (CODES-TABLE A.6)	23	[23]
* 6.	SURFACE THICKNESS (INCHES)	1.5	[9.5]
* 7.	BASE THICKNESS (INCHES)	13.5	[13.5]

* 8. TYPE OF SHOULDER RESTORATION [1]
- AC Overlay Without Removal of Existing AC..... 1
- Cold Milling and AC Overlay..... 2
- Complete Shoulder Removal and Replacement..... 3
- In-place Recycling and Overlay..... 4
- Other (Specify)_____ 5

* 9. TYPE OF AC MATERIALS [1]
- New Materials..... 1
- Hot Recycled Materials..... 2
- Cold Recycled Materials..... 3
- Other (Specify)_____ 4

*10. THICKNESS OF AC MATERIAL REMOVED BY COLD MILLING (IN) [0.0]

*11. AC OVERLAY THICKNESS (IN) [2.0]

12. LANE/SHOULDER JOINT SEALANT [1]
- None..... 1
- Sealed Without Providing Reservoir..... 2
- Saw Reservoir and Seal..... 3
- Other (Specify)_____ 4

13. LANE/SHOULDER JOINT SEALANT RESERVOIR
- WIDTH (INCHES) 0.0
- DEPTH (INCHES) 0.0

14. TYPE OF JOINT SEALANT 2
- Poured..... 1
- Preformed..... 2

NOTE: DATA ITEMS 8. TO 14. PERTAIN ONLY TO THE RESTORED OUTSIDE SHOULDER.

*STATE ASSIGNED ID [_ _ _ _]

SHEET 61

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [A 5 0 6]

LTPP PROGRAM

RESTORATION OF AC SHOULDERS

* 1. SHOULDER RESTORED [3]
- Outside 1
- Inside 2
- Both 3

		INSIDE SHOULDER	OUTSIDE SHOULDER
* 2.	SURFACE TYPE (CODES-TABLE A.5)	1	[1]
* 3.	TOTAL WIDTH (FEET)	1 0.	[1 8.]
* 4.	PAVED WIDTH (FEET)	1 0.	[1 5.]
* 5.	SHOULDER BASE TYPE (CODES-TABLE A.6)	2 3	[2 3]
* 6.	SURFACE THICKNESS (INCHES)	_ 1.5	[_ 9.5]
* 7.	BASE THICKNESS (INCHES)	1 3.5	[1 3.5]

* 8. TYPE OF SHOULDER RESTORATION [2]
- AC Overlay Without Removal of Existing AC..... 1
- Cold Milling and AC Overlay..... 2
- Complete Shoulder Removal and Replacement..... 3
- In-place Recycling and Overlay..... 4
- Other (Specify)_____ 5

* 9. TYPE OF AC MATERIALS [1]
- New Materials..... 1
- Hot Recycled Materials..... 2
- Cold Recycled Materials..... 3
- Other (Specify)_____ 4

*10. THICKNESS OF AC MATERIAL REMOVED BY COLD MILLING (IN) [1.5]

*11. AC OVERLAY THICKNESS (IN) [2.0]

12. LANE/SHOULDER JOINT SEALANT [1]
- None..... 1
- Sealed Without Providing Reservoir..... 2
- Saw Reservoir and Seal..... 3
- Other (Specify)_____ 4

13. LANE/SHOULDER JOINT SEALANT RESERVOIR
- WIDTH (INCHES) 0.0
- DEPTH (INCHES) 0.0

14. TYPE OF JOINT SEALANT 2
- Poured..... 1
- Preformed..... 2

NOTE: DATA ITEMS 8. TO 14. PERTAIN ONLY TO THE RESTORED OUTSIDE SHOULDER.

SHEET 61

REHABILITATION DATA

LTPP PROGRAM

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 7]

RESTORATION OF AC SHOULDERS

* 1. SHOULDER RESTORED [3]
- Outside 1
- Inside 2
- Both 3

		INSIDE SHOULDER	OUTSIDE SHOULDER
* 2.	SURFACE TYPE (CODES-TABLE A.5)	1	[1]
* 3.	TOTAL WIDTH (FEET)	10.	[18.]
* 4.	PAVED WIDTH (FEET)	10.	[15.]
* 5.	SHOULDER BASE TYPE (CODES-TABLE A.6)	23	[23]
* 6.	SURFACE THICKNESS (INCHES)	1.5	[9.5]
* 7.	BASE THICKNESS (INCHES)	13.5	[13.5]

* 8. TYPE OF SHOULDER RESTORATION [2]
- AC Overlay Without Removal of Existing AC..... 1
- Cold Milling and AC Overlay..... 2
- Complete Shoulder Removal and Replacement..... 3
- In-place Recycling and Overlay..... 4
- Other (Specify)_____ 5

* 9. TYPE OF AC MATERIALS [1]
- New Materials..... 1
- Hot Recycled Materials..... 2
- Cold Recycled Materials..... 3
- Other (Specify)_____ 4

*10. THICKNESS OF AC MATERIAL REMOVED BY COLD MILLING (IN) [1.5]

*11. AC OVERLAY THICKNESS (IN) [5.0]

12. LANE/SHOULDER JOINT SEALANT [1]
- None..... 1
- Sealed Without Providing Reservoir..... 2
- Saw Reservoir and Seal..... 3
- Other (Specify)_____ 4

13. LANE/SHOULDER JOINT SEALANT RESERVOIR
- WIDTH (INCHES) 0.0
- DEPTH (INCHES) 0.0

14. TYPE OF JOINT SEALANT N
- Poured..... 1
- Preformed..... 2

NOTE: DATA ITEMS 8. TO 14. PERTAIN ONLY TO THE RESTORED OUTSIDE SHOULDER.

*STATE ASSIGNED ID [_ _ _ _]

SHEET 61

*STATE CODE [4 8]

REHABILITATION DATA

*SHRP SECTION ID [A 5 0 8]

LTPP PROGRAM

RESTORATION OF AC SHOULDERS

* 1. SHOULDER RESTORED [3]
- Outside 1
- Inside 2
- Both 3

		INSIDE SHOULDER	OUTSIDE SHOULDER
* 2.	SURFACE TYPE (CODES-TABLE A.5)	1	[1]
* 3.	TOTAL WIDTH (FEET)	1 0.	[1 8.]
* 4.	PAVED WIDTH (FEET)	1 0.	[1 5.]
* 5.	SHOULDER BASE TYPE (CODES-TABLE A.6)	2 3	[2 3]
* 6.	SURFACE THICKNESS (INCHES)	1.5	[9.5]
* 7.	BASE THICKNESS (INCHES)	1 3.5	[1 3.5]

* 8. TYPE OF SHOULDER RESTORATION [2]
- AC Overlay Without Removal of Existing AC..... 1
- Cold Milling and AC Overlay..... 2
- Complete Shoulder Removal and Replacement..... 3
- In-place Recycling and Overlay..... 4
- Other (Specify)_____ 5

* 9. TYPE OF AC MATERIALS [2]
- New Materials..... 1
- Hot Recycled Materials..... 2
- Cold Recycled Materials..... 3
- Other (Specify)_____ 4

*10. THICKNESS OF AC MATERIAL REMOVED BY COLD MILLING (IN) [1.5]

*11. AC OVERLAY THICKNESS (IN) [5.0]

12. LANE/SHOULDER JOINT SEALANT [1]
- None..... 1
- Sealed Without Providing Reservoir..... 2
- Saw Reservoir and Seal..... 3
- Other (Specify)_____ 4

13. LANE/SHOULDER JOINT SEALANT RESERVOIR
- WIDTH (INCHES) 0.0
- DEPTH (INCHES) 0.0

14. TYPE OF JOINT SEALANT 2
- Poured..... 1
- Preformed..... 2

NOTE: DATA ITEMS 8. TO 14. PERTAIN ONLY TO THE RESTORED OUTSIDE SHOULDER.

SHEET 61

REHABILITATION DATA

LTPP PROGRAM

*STATE CODE [4 8]

*SHRP SECTION ID [A 5 0 9]

RESTORATION OF AC SHOULDERS

* 1. SHOULDER RESTORED [3]
- Outside 1
- Inside 2
- Both 3

		INSIDE SHOULDER	OUTSIDE SHOULDER
* 2.	SURFACE TYPE (CODES-TABLE A.5)	1	[1]
* 3.	TOTAL WIDTH (FEET)	1 0.	[1 8.]
* 4.	PAVED WIDTH (FEET)	1 0.	[1 5.]
* 5.	SHOULDER BASE TYPE (CODES-TABLE A.6)	2 3	[2 3]
* 6.	SURFACE THICKNESS (INCHES)	1.5	[9.5]
* 7.	BASE THICKNESS (INCHES)	1 3.5	[1 3.5]

* 8. TYPE OF SHOULDER RESTORATION [2]
- AC Overlay Without Removal of Existing AC..... 1
- Cold Milling and AC Overlay..... 2
- Complete Shoulder Removal and Replacement..... 3
- In-place Recycling and Overlay..... 4
- Other (Specify)_____ 5

* 9. TYPE OF AC MATERIALS [2]
- New Materials..... 1
- Hot Recycled Materials..... 2
- Cold Recycled Materials..... 3
- Other (Specify)_____ 4

*10. THICKNESS OF AC MATERIAL REMOVED BY COLD MILLING (IN) [1.5]

*11. AC OVERLAY THICKNESS (IN) [2.0]

12. LANE/SHOULDER JOINT SEALANT [1]
- None..... 1
- Sealed Without Providing Reservoir..... 2
- Saw Reservoir and Seal..... 3
- Other (Specify)_____ 4

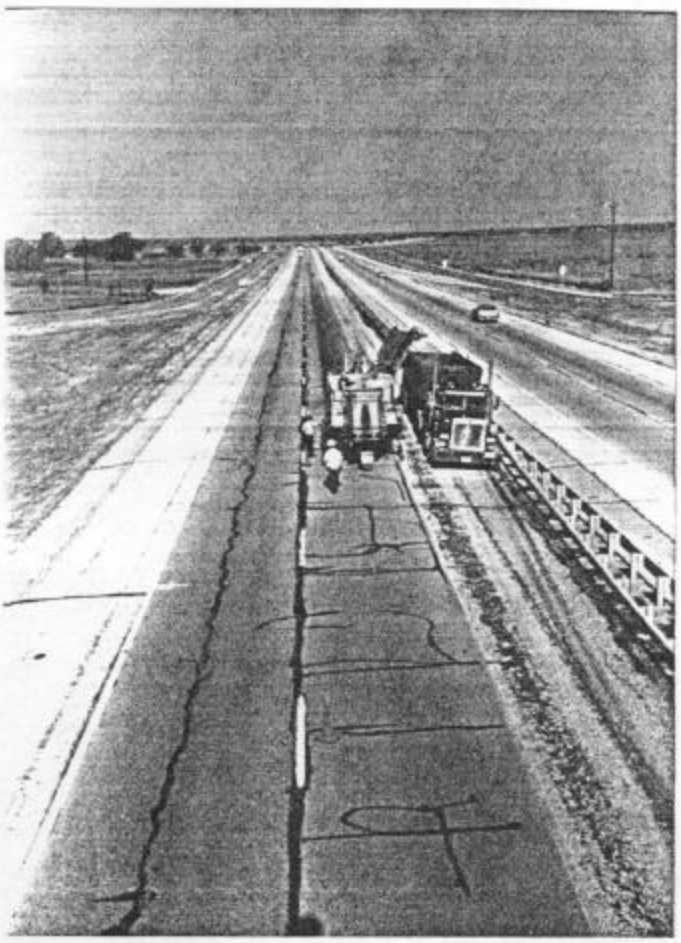
13. LANE/SHOULDER JOINT SEALANT RESERVOIR
- WIDTH (INCHES) 0.0
- DEPTH (INCHES) 0.0

14. TYPE OF JOINT SEALANT N
- Poured..... 1
- Preformed..... 2

NOTE: DATA ITEMS 8. TO 14. PERTAIN ONLY TO THE RESTORED OUTSIDE SHOULDER.

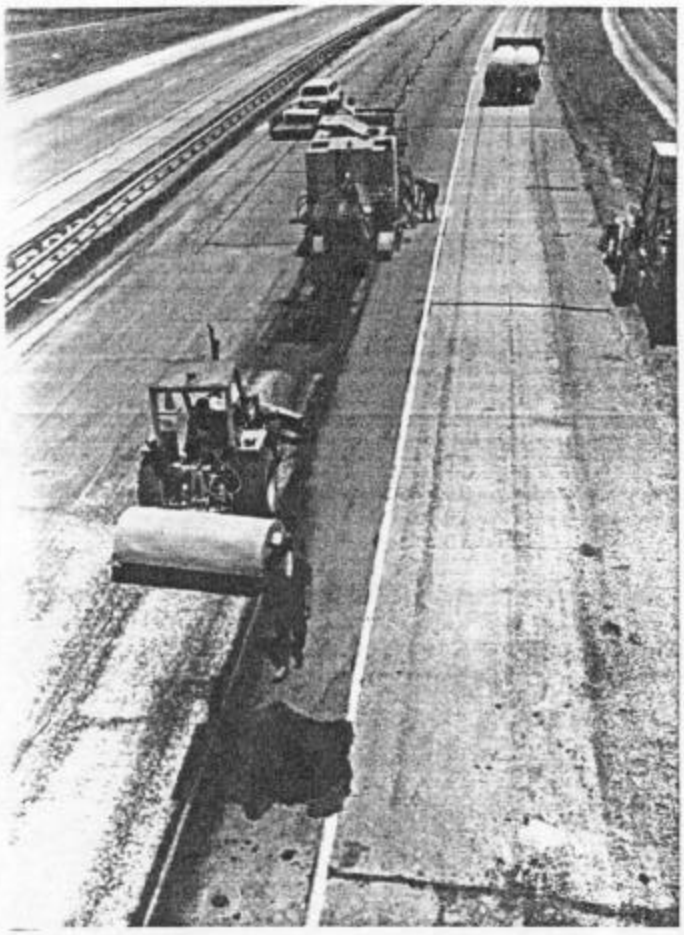
APPENDIX F

PHOTOGRAPHS

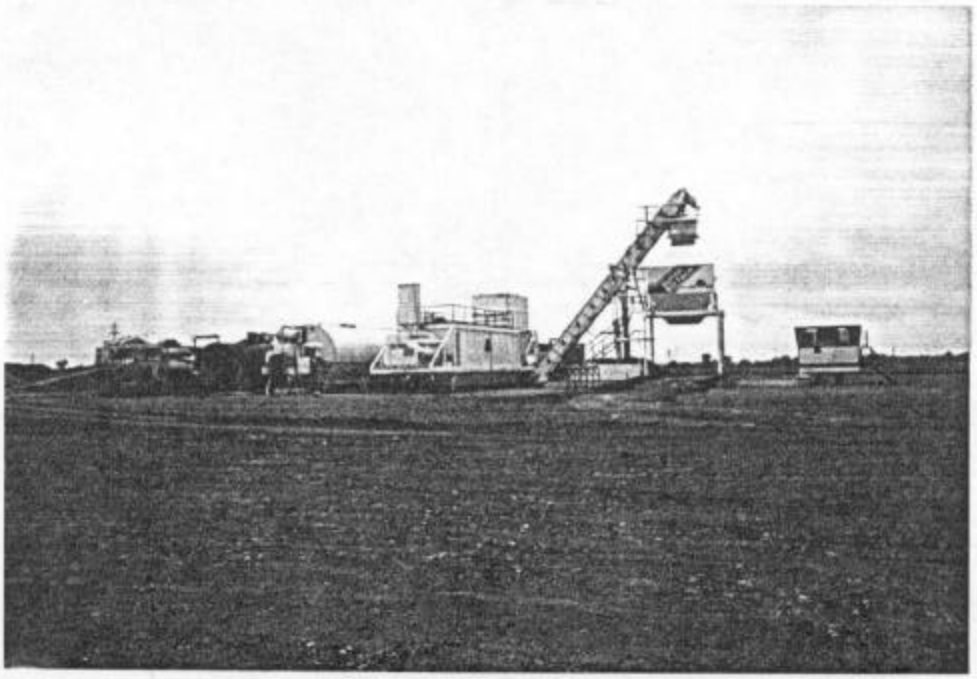


1 - Overview of 48A500 and Milling Operation

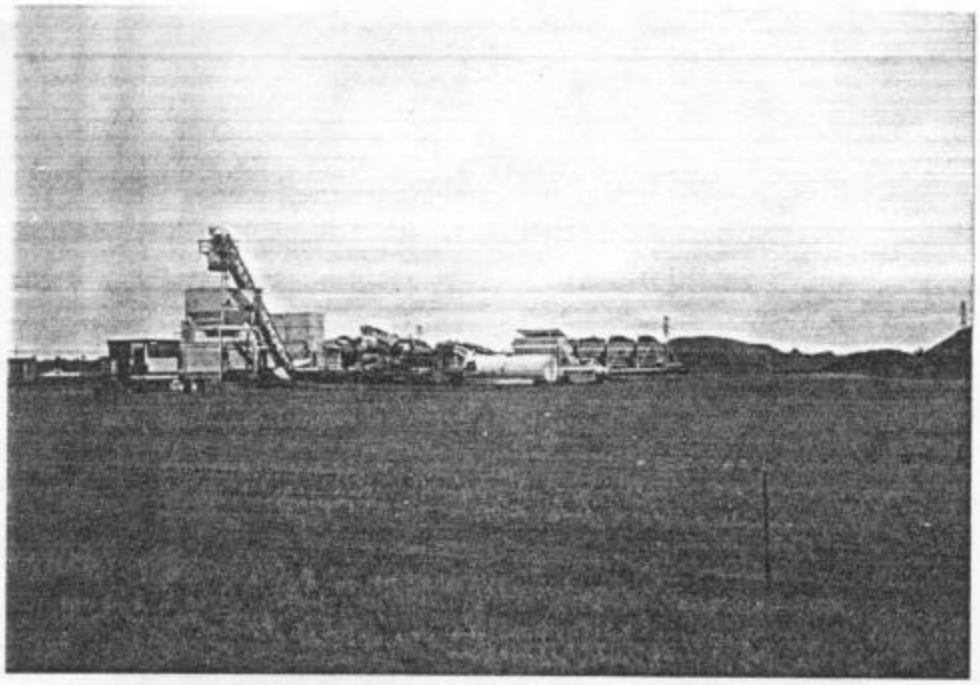
2 - Closeup of Milling Machine



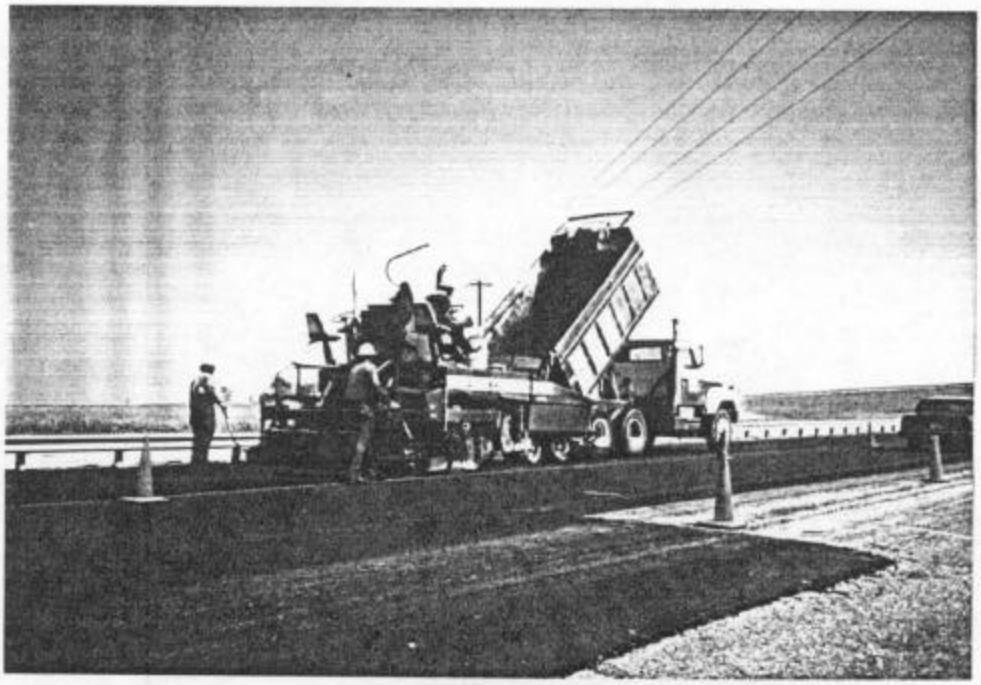
3 - Overview of Milling Operation



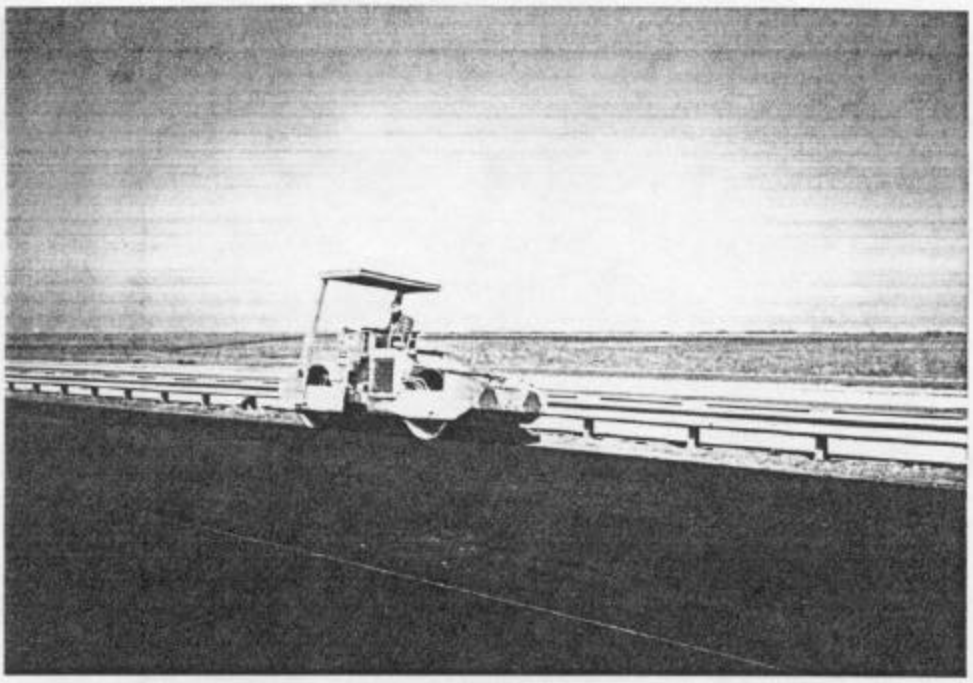
4 - Aztec "Super 6 Pack" Drum Mix Plant



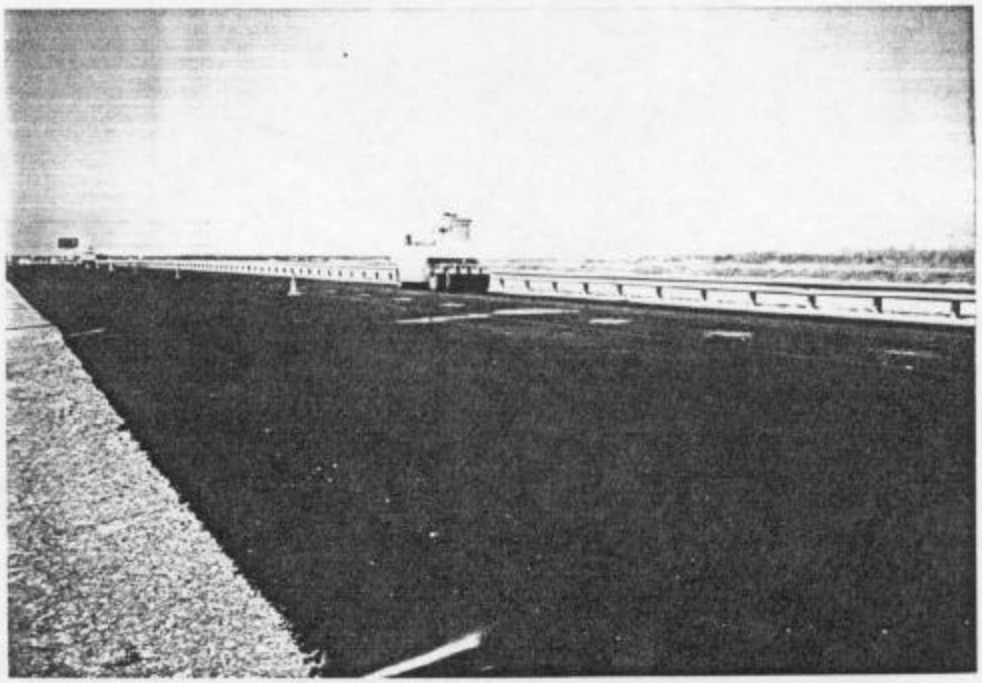
5 - Plant and Stockpiles



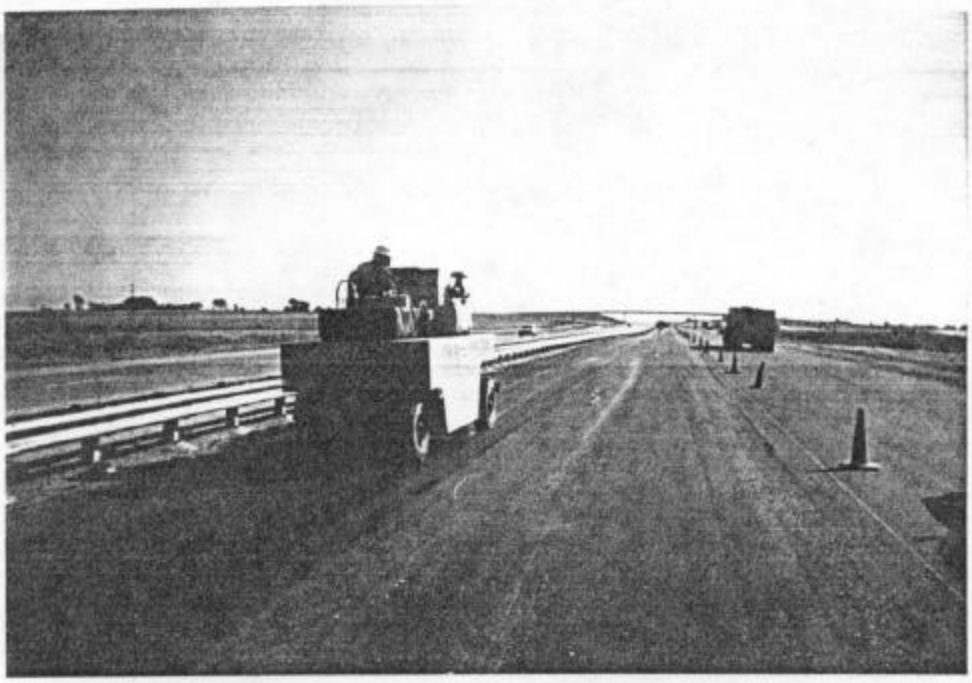
6 - Barber Greene SB-140 Paver Placing 2nd Lift of Virgin Binder Adjacent to Section 48A507



7 - Tampo 8-Ton Double Drum Vibratory Breakdown Roller on 1st Lift of Virgin Binder Adjacent to Section 48A507



8 - Ingram 10-Ton Pneumatic-Tired Intermediate Roller on 1st Lift of Virgin Binder Adjacent to Section 48A504



9 - Another View of Ingram Pneumatic Roller

10 - Ingram 8-Ton Steel-Wheel Tandem Final Roller on 1st Lift of Virgin Binder Adjacent to Section 48A504