FL SPS-5

Brent Rauhut Engineering Inc.

26 April 1996

Mr. Monte Symons
Pavement Performance Division - LTPP (HNR-40)
Federal Highway Administration
Turner-Fairbanks Highway Research Center
6300 Georgetown Pike, Room F-215
McLean, Virginia 22101

Subject: Final Report - Construction of SPS-5 Project (1205) on US-1 in Martin County, Florida

Dear Monte,

Enclosed is the Final Report for the Specific Pavement Studies (SPS-5) project on US-1 in Martin County, Florida. This report documents the construction of the rehabilitation study test sections at this location.

Please feel free to contact me should you have any questions or comments regarding any of the information included in this report.

Sincerely,

Mark D. Sargent
Project Engineer, SRCO

MDS:dmj

Enclosure: As stated.

c.w/Enc: Larry Smith, FLDOT
Jamshid Armaghani, FLDOT
Bill Miley, FLDOT
Ron McNamara, FLDOT
Evan Wisniewski, FHWA - Reg. 4
John Miller, PCS/LAW-Kennesaw, GA
Mark Gardner, SRCO/File: 1205FR

c.w/o Enc: Morris Reinhardt, RE/SRCO

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FINAL REPORT

SPS-5 PROJECT 1205
ASPHALT REHABILITATION STUDY
US-1, SOUTHBOUND
MARTIN COUNTY, FLORIDA

FHWA/LTPP

SOUTHERN REGION COORDINATION OFFICE

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ASPHALT REHABILITATION STUDY
US-1, SOUTHBOUND
MARTIN COUNTY, FLORIDA

INTRODUCTION

As part of the Strategic Highway Research Program's (SHRP) Long Term Pavement Performance (LTPP) Study, sections of highway are being selected to apply very specific treatments to study various facets of construction (both new and rehabilitated). These projects are referred to as Specific Pavement Studies (SPS). This particular project, on US-1 in Martin County, Florida, was identified as a potential candidate for inclusion in the evaluations of asphalt concrete rehabilitation (SPS-5).

SPS-5 General Experiment Design

The anticipated products of the SPS-5 experiment are included in Table 1. The overall intent of the experiment is to evaluate some of the more common asphalt rehabilitation techniques currently used by State Highway Agencies (SHAs). This general evaluation is intended to include condition of the pavement prior to overlay (both structurally and functionally), the loading conditions the project 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 standard SPS-5 experiment includes four test sections which are subjected to intensive surface preparation (milling) prior to overlay vs. four test sections which will undergo minimal surface preparation, four test sections utilizing recycled mix vs. four with virgin mix and thin overlays (approximately 2") vs. thick overlays (approximately 5"). The eight test sections represent combinations of the above mentioned features and are placed adjacent to the control section (121030, which receives no rehabilitation) for comparison purposes. Minimal surface preparation will include the removal of an existing ¾" friction course from all SPS-5 test section surfaces. Patch and/or crack-sealing was also an option. Intensive surface preparation includes an additional 2" of milling to be conducted along with patching, if necessary.

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-1

The Florida SPS-5 site location was identified through efforts of the Florida DOT SPS program. The Florida DOT reviewed anticipated rehabilitation programs over a five-year period. The list of potential rehabilitation projects which fit the experiment design criteria was narrowed to one

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		
SURFACE PREP	OVERLAY MATERIAL	OVERLAY THICKNESS
Routine Maint. (Control)		0"
MINIMUM	Recycled AC	2"
		5"
	Virgin AC	2"
		5"
INTENSE	Recycled AC	2"
		5"
	Virgin AC	2"
		5"

FACTORS FOR MOISTURE, TEMPERATURE, AND PAVEMENT CONDITION															
WET								DRY							
FREEZE				NO FREEZE				FREEZE				NO FREEZE			
FAIR		POOR		FAIR		POOR		FAIR		POOR		FAIR		POOR	
				X											
				X											
				X											
				X											
				X											
				X											
				X											
				X											
				X											

Subgrade Soil: Fine

Traffic: > 85 KESAL/Year

X = Sections on 48A500

potential site. As a result, an SPS-5 candidate project was nominated by the State of Florida on 2 May 1990. Correspondence and site information is included in Appendix A. The project site was located on US-1 near Jupiter, Florida, which was located near an existing GPS test section (121030). The GPS project information sheet and section field verification form for 134119 was submitted during the nomination process. The numerical grading system form, which was developed for evaluating the nomination potential, provided a total combined score of 94/120. The project site, located near the East Coast of Florida, generally exhibited a flat terrain with some hilly areas. Every attempt was made to maintain the entire 500-foot limit outside of cut/fill transitions. This particular project site was representative of coarse-grained soils. Traffic levels for this particular site were estimated at approximately 340 KESALs/year in the design lane. The state included 3.5-inch overlay test sections as transition segments between the standard 2-inch and 5-inch SPS-5 test sections. The 3.5-inch overlay test sections represented both virgin and recycled mixes, which were included in the design as supplemental test sections. The project located on US-1, in Martin County, Florida, was officially approved on 6 June 1990.

Specific Experiment Design for IH-75

The layout from the plans for this particular project are included in Appendix A. This project is represented by 14 test sections, of which six are state-supplemental. All of the SPS-5 (1205) test sections are located immediately north of the General Pavement Study (GPS) Test Section 121030. Four of the state supplemental test sections included in this project consisted of a 3½-inch overlay to provide a graduated transition between the 2-inch and 5-inch overlays. The remaining two state supplemental test sections consisted of "mill and inlay" only, representing both the virgin and recycled mixes. Both of the "mill and inlay" test sections were positioned immediately north of GPS Test Section 121030.

PRECONSTRUCTION MONITORING

A number of preconstruction monitoring measurements were performed on US-1 to establish the condition prior to rehabilitation. Each preconstruction monitoring endeavor will be discussed separately in the following text.

Pavement Surface Distress

Prior to rehabilitation, each test section was identified with paint and an offset stake, both in the outside shoulder and median, etc., to allow for the collection of pavement surface distress. Each test section was rated manually using the SHRP Distress ID Manual. The predominant distress throughout all test sections was medium severity fatigue cracking in both wheelpaths. This roadway segment included a ¾-inch surface friction course, which appeared to be delaminating in some areas.

Surface Profile

Surface profile measurements were performed on 24 May 1994, utilizing the SHRP/LTPP profilometer Model 690DNC Inertial Profilometer, manufactured by K.J. Law Engineering, Inc. The K.J. Law high-speed profilometer collects data in the travel lane of each section at 6-inch increments. Results of this work are included in Table 2.

TABLE 2. PROFILE READINGS
INTERNATIONAL ROUGHNESS INDEX (IRI) - INCHES/MILES

Test Section	Mean Values		Mean Values	
	Preconstruction		Postconstruction	
	Date Surveyed: 25 May 94		Date Surveyed: 2 November 95	
	LWP	RWP	LWP	RWP
120502	62.7	70.3	42.4	44.6
120561	79.7	79.1	30.2	41.0
120503	70.5	58.9	40.8	52.2
120508	83.3	61.1	44.6	46.5
120565	84.9	74.5	34.5	50.4
120509	65.2	69.9	30.0	41.8
120506	60.7	61.0	28.1	34.9
120566	70.1	77.9	30.2	39.2
120507	73.2-	73.4-	29.6	39.5
120504	90.9	83.8	32.0	49.4
120562	70.6	64.7	24.2	33.4
120505	91.2	94.2	26.3	34.9
120563	76.5	90.7	35.4	39.6
120564	74.9	87.8	27.6	35.1
121030	78.9	107.8	29.3	43.1
Average	**75.6**	**77.0**	**32.3**	**41.7**

Structural Capacity

Deflection measurements were performed beginning on 25 May 1994, in conjunction with materials sampling. Deflection measurements were obtained using the SHRP Falling Weight Deflectometer (FWD) to evaluate the structural capacity of each of these test sections. Deflection measurements were recorded from a series of varying weights in a set pattern at 25-feet intervals to measure the subsurface response (deflection) of the structural layers in that highway segment. Results of the deflection testing are included in Appendix B.

Materials Sampling and Testing

Materials sampling and testing was performed, as mentioned above, in conjunction with FWD measurements, by representatives of the Southern Region Coordination Office (SRCO) and Florida DOT personnel, following a Materials Sampling and Testing Guide established specifically for this project (see Appendix C).

CONSTRUCTION

Following are details of the construction event relating to the asphalt rehabilitation on US-1 in the southbound lane of Martin County, Florida.

Wednesday, 5 April 1995

Today we went and located each of the temporary benchmarks established during the preconstruction sampling. We also established additional offsets. At this point, all of the median has been disturbed and as a result all offsets and benchmarks are suspect. We also observed that the contractor had milled roughly 50 feet into Test Section 120502. As a result, the beginning of this test section has been compromised as it is to receive no milling with a 2-inch overlay only. I brought this to the attention of the Senior Inspector for Kisinger Campo.

Thursday, 6 April 1995

A company by the name of Mill-It Corporation, located in Allamonte Springs, Florida, is performing the milling operation. They are utilizing two pieces of milling equipment. A brand new ROADTECH RH-68 with a 96-inch cutting head is being used to perform a majority of the milling work. The remaining 4 feet to be milled will be done with an Ingersol-Rand Model №. MT-6520. This particular piece of equipment has a 6.4-foot cutting head. By the way, the ROADTECH equipment has a cutting head width of 8 feet, which is a 96-inch cutting head. They began milling today on the inside lane, heading north in the southbound lanes, beginning immediately north of the 500-foot lead-in to the GPS test section. Currently, they are milling 2.5 inches in depth. It is the intent of the milling company to mill and remove the friction course from all test sections within the limits of the site.

Tuesday, 11 April 1995

7:00 a.m. - The paving contractor, Dickerson Paving Contractors, is currently working on the very inside of the outside lane. Currently, they are utilizing an 8-ton Case Model 776 breakdown

roller with two coverages followed by a pneumatic roller averaging 9 tons, making five coverages followed by another double-drum steel-wheel roller at 10 tons. The pneumatic roller is a Hyster Model C5308, weighing 9740 lb.

11:30 a.m. - They are beginning at the far end of Test Section 120504 with 2½ inches of uncompacted SII mix, which is the first lift overlay on that particular test section. The temperature is roughly 80°F with a light cool breeze. The contractor did broom and tack the milled surface prior to this lift.

12:00 noon - We are entering the 5+00 mark of Test Section 120507. The contractor is currently putting down 3 inches of uncompacted SII type material. Prior to the placement of the SII mix on milled surface, the contractor placed .05 gallons per square yard of RS1 tack. It is anticipated that subsequent HMAC layers will receive between .02 and .03 gallons per square yard.

12:40 p.m. - The contractor has just entered Test Section 120566. There is a delay at 50 feet within the test section.

Just visited the plant (#10), which is the Dickerson Plant, a 6000 lb. batch plant, barber green. Plant phone number is 287-6341. This plant is located on 96th Street, west of IH-95. The Dickerson Plant #10 is located roughly 16 miles from the SPS-5 site. It takes roughly 25 minutes to travel from the plant to the site.

6:35 p.m. - The contractor has just finished breakdown roller efforts on Test Section 120565, which is a mill and inlay with a 3½-inch overlay test section, a recycled asphalt pavement supplemental test section. This is the first lift that they have put down, which is a 3-inch uncompacted lift, to attain 2½ inches of SII recycled mix containing 30% recycled asphalt pavement.

Wednesday, 12 April 1995

7:00 a.m. - The contractor is about to enter Test Section 120508, (mill and inlay with 5-inch overlay of recycled material). This is the first lift for this test section which is being placed directly on top of a milled surface.

The contractor is currently entering Test Section 120503, a 5-inch overlay of recycled asphalt pavement. The material is SII recycled pavement, being placed at 2½ inches (uncompacted material). The SII material is being placed on top of milled surface, making this the first lift for this test section. Construction of the first lift of SII recycled pavement on Test Section 120503 was interrupted roughly 75 feet before reaching the beginning of the test section. The contractor had inadvertently switched the plant over the SI mix, leaving one truckload shy for finishing the test section. Again, the contractor is paving against traffic, which means that the latter 475 feet of the test section is currently paved with the first lift of SII mix. The contractor estimates 45 minutes before another load of SII mix can be transported to the site.

A side note on the construction of the SII mix. This is a very coarse mix in nature and can be susceptible to segregation, which we have observed from time to time in the midlane. I should probably qualify "segregation" in this instance as observing concentrated areas of pulled

aggregate, typically observed in the midlane. The compaction efforts, however, seem to be able to provide a smooth matt.

1:40 p.m. - The contractor is about to enter Test Section 120562, which is a supplemental test section, having 3½ inches of virgin material placed. The contractor is entering the southbound side of that test section; hence, paving in the northbound direction from 5+00 towards 0+00. The contractor has just completed the first lift of SI virgin material for this test section. A 1 5/8-inch uncompacted mat was placed to attain 1¼-inch compacted lift of SI virgin-type material. The time was 2:12 p.m. when this test section was completed.

3:25 p.m. - The contractor is currently placing the second lift within Test Section 120507, beginning at 5+00 towards 0+00. This is the SI type virgin material, being placed at 1 7/8 inch, targeting a compacted lift of 1½ inches.

4:30 p.m. - The contractor is prepared to place SI recycled mix as the first lift for Test Section 120509. The contractor broomed the milled surface and applied an RS1 tack coat at roughly .05 gallons per square yard.

The contractor is currently entering Test Section 120508 with a second lift of SI recycled mix. The contractor is placing 1¾ inches of uncompacted mix to attain the 1½ inches of compacted material.

Thursday, 13 April 1995

The contractor is currently entering Test Section 120561, laying a 1¼-inch mat of SI recycled mix. This is the first course over milled surface.

7:30 a.m. - The contractor is placing mix at 2+00 of Test Section 120561. We're collecting three samples from this test section of this SI recycled mix. We are observing temperatures of 280°F in the uncompacted mat.

8:00 a.m. - The contractor has finished placing the first lift of the SI material on this test section.

The contractor is currently paving the outside lane at Stations 189+00, which leads into the 5+00 end of Test Section 120563. This is the first lift of SI virgin mix. The contractor is attempting to lay 1-5/8 inches of uncompacted material to attain a 1¼-inch compacted mat.

Friday, 14 April 1995

6:45 a.m. - The contractor is beginning the day by placing a second lift, 2 inches of virgin SI type material in Test Section 120566. This requires the placement of 2½ inches of uncompacted material to attain the desired compacted lift of 2 inches.

10:15 a.m. - The contractor has just entered Test Section 120504 at the leave end (5+00). This is the third lift for this test sections which includes 1½ inches of SI compacted type material.

10:30 a.m. - The contractor is now entering Test Section 120507. This is the fourth lift constructed in this test section, consisting of 1½ inches of compacted SI type material.

5:20 p.m. - The contractor is now putting down a 1½-inch compacted mat on Test Section 120509. This is the second lift to be placed on this test section.

Monday, 17 April 1995

7:30 a.m. - The contractor is passing through the 1500 foot transition through the Coast Guard entrance, again entering Test Section 120509. The contractor is placing 1½ inches of SI recycled mix. There is a small amount of segregation visible in the mat after the laydown machine. At Test Section 120508, segregation is also evident within the mat.

7:45 a.m. - The contractor is currently reaching the 5+00 end of Test Section 120508, thus traveling in the northbound direction in the southbound lane (outside lane). (Side Note for Test Section 120508 - I noticed that the outer 18 inches of the surface to receive a lift of asphalt was not sufficiently tacked. It appears that the spray nozzles were stuck, thus leaving an 18-inch swath throughout the test section untacked.

7:58 a.m. - The contractor is now entering the leave end of Test Section 120503, placing a 1½-inch lift of compacted recycled asphalt pavement. This is the third lift, an SI material.

The contractor has now completed the construction of the third lift of SI material for Test Section 120503. During the placement of this particular lift of material in Test Section 120503, we observed temperatures in the uncompacted mat between 265°F and 275°F. The time for completion of the third lift of material on this test section is 8:09 a.m.

8:35 a.m. - The contractor is now entering Test Section 120561 at the leave end.

11:09 a.m. - The contractor is entering Test Section 120502 at the leave end, placing 1¼ inches of SI recycled mix.

3:30 p.m. - The contractor is now entering Test Section 120508 in the outside lane from the leave end, placing a 1½-inch lift of recycled SI type material. Temperatures were observed in the mat after the laydown machine at 300°F. The construction of the final lift of material for this test section was completed this day at 4:10 p.m.

4:30 p.m. - The contractor is currently entering 120503 at the leave end. This will be the final lift of recycled SI type material for this test section. This final lift is constructed of 1½ inches of recycled SI type material. This test section was finalized with the final lift at 5:00 p.m. this day.

Tuesday, 18 April 1995

The contractor is now entering Test Section 120563, constructing a ¾-inch compacted lift of virgin SIII type material. It is anticipated that the contractor will begin placing this material at roughly 189+00 within the transition and continue construction through to Test Section 120562,

to 228+00. The time at which the contractor entered the leave end of Test Section 120563 is approximately 10:00 a.m.

10:15 a.m. - The contractor is now entering the leave end of Test Section 120505, constructing a ¾-inch lift of SIII type virgin material. This will be the final lift of material for this test section prior to friction course.

12:15 p.m. - The contractor is now entering the leave end of Test Section 120562, placing a 1-inch compacted lift of SIII type virgin material.

1:00 p.m. - The contractor has finished constructing the 1-inch lift of SIII type virgin material for this test section.

The contractor will maintain paving efforts through to 229+00 with the transition between Test Section 120504, heading for Test Section 120566, the leave end thereof at Station 246+00, before beginning paving operations on that test section.

Wednesday, 19 April 1995

The contractor is preparing to pull through the final two test sections, 120561 and 120502. Each will receive a thin compacted lift of SIII type recycled material. Test Section 120561 will receive 1-inch of SIII, while Test Section 120502 will received only ¾-inch.

7:00 a.m. - After pulling the recycled SIII mix through these two test sections, the contractor will return to the far end of the project and overlay Test Section 120564 with ¾-inch of the SIII recycled material. The weather is clear and sunny and at this time 73°F. For the SIII material, all compaction efforts have begun with the Hyster C340CW 20,000 lb. roller, followed by a Hyster C530A pneumatic 18,000 lb. roller, followed by the smaller Case Model 752 9-ton steelwheel roller.

8:06 a.m. - The contractor has just entered Test Section 120502 at the leave end, placing a ¾-inch compacted mat of SIII recycled material. Temperatures observed in this uncompacted mat were at 250°F, for the final lift of the SIII recycled material at ¾ inch.

POSTCONSTRUCTION MONITORING

Following the completion of all rehabilitation applications, postconstruction monitoring was initiated. These monitoring activities consisted of those same types of monitoring activities that took place prior to construction.

Pavement Surface Distress

Following construction, all test sections were identified by paint and filmed by video. All test sections were also filmed by the PASCO ROADRECON unit on 21 January 1996.

Surface Profile

In addition to the rod and level measurements, all sections were again profiled using the SHRP high-speed profilometer on 11 November 1995. Transverse profile measurements were again collected by the PASCO ROADRECON unit on 21 January 1996. The plots of rod and level data before and after overlay are available in Appendix D, which exhibit changes in the transverse profile overall.

Structural Capacity

Deflection measurements were again taken, after completion of the rehabilitation applications, on 5 December 1995. These results are also included in Appendix B. The structural response appeared to improve (less deflection was observed) after completion of the overlays, with the greatest improvements being observed in the sections with thicker overlays, as expected.

Materials Sampling and Testing

The postconstruction sampling and testing (coring of 4-inch cores) on 16 May 1995. Coring was performed 50 feet from the approach and leave end of each test section following a layout diagram indicated in the Material Sampling Plan prepared for this experiment. Sampling was conducted by the Florida DOT under the supervision of the SRCO personnel. Testing is currently underway and near completion, utilizing SHRP test protocols with the exception of P06 creep compliance and P46 resilient modulus of the subgrade. It is our understanding that those samples to be tested under those protocols will be set aside in storage until the required testing protocols are available.

All cores were measured for thickness per LTPP protocol. Also, rod and level data obtained between overlay lifts will provide overall thickness information. Rod and level shots were obtained at 0-feet, 3-feet, 6-feet, 9-feet and 12-feet from the outside edge of the pavement at 50-foot intervals along the 500-foot monitoring portion of the test sections. Results of this endeavor are available in Appendix E.

SUMMARY

After review of all pertinent data retrieved from the ensuing construction events, additional monitoring efforts have begun of the test sections located on US-1 in Martin County, Florida. It appears that this project will contribute significantly to the research efforts. Special consideration should be given to members of the Florida Department of Transportation. In particular, much of the credit is due to Larry Smith, Bill Miley, Ron McNamara, and Scott Cushing, for their efforts in expediting the necessary tasks to make this project possible.

Currently, monitoring efforts are scheduled and we will continue noting changes in the surface distress, surface profile and structural capacity, and compare those data with other projects of this nature around the country in an attempt to improve on existing asphalt pavement rehabilitation design methods.

APPENDIX A

SITE BACKGROUND DATA

Brent Rauhut Engineering Inc.

May 2, 1990

Mr. Gary E. Elkins
Texas Research & Development Foundation
6811 Kenilworth Avenue, Suite 230
Riverdale, Maryland 20737

Subject: Nomination of Additive SPS-5 Project in Florida.

Dear Gary,

Attached you will find SPS-5 nomination forms for an additive project in Florida. As I have previously discussed with you, the subgrade for this project is clearly sand, so it is not offered to fill any particular cell in the experiment at this time, but might end up serving that purpose if no other project on fine-grained soil is found for the cell in which this one would fit. By an "additive project", I am referring to the agreement by the Pavement Performance Advisory Committee that a few additional projects could be accepted and monitored where the State Highway Agencies were especially eager to construct a project and learn from it.

With the exception of a coarse subgrade, this is almost a "storybook project". The entire area to be included in the project is straight, virtually level, has almost uniform distress, has no structures to avoid, has no roadways that would affect truck traffic to any appreciable degree, and any changes in the traffic will be limited in the future because the direction of travel which would be considered runs adjacent to a state park. Florida plans supplemental sections that will include their own recycling practice and variable overlay thicknesses. The Florida DOT furnished us the results of Dynaflect deflection testing, which indicates that the response to load is very uniform throughout. Using our evaluation system (see our Nov. 10, 1989 letter), the project would have scored 94 of a possible 120, if it were not for having a sand subgrade.

It is my understanding that SPS-5 projects have been approved in other regions through misinterpretation of the guidelines, and that replacement projects are to be sought with fine-grained subgrade (per Neil Hawks guidance during the San Antonio meeting in February). This appears to offer some opportunity for at least limited comparative analysis of the performance of the experimental pavements on coarse subgrade in several climatic zones.

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As indicated on the nomination forms, GPS test section 121030 is located within the project limits, so there will not be any additional mobilization costs to monitor this location. Further, monitoring of this project would also offer three GPS-6B test sections (including a supplemental section with a 3½" overlay) that may be included in the data base. Considering that SHRP is normally responsible for materials sampling and testing for GPS-6B projects, the limited costs to SHRP for monitoring appear to be a reasonable investment.

As a final argument in favor of approval of this request, I would like to point out that the Florida DOT has always been very ready to participate in research, and are in fact heavily committed to the SHRP LTPP program.

Best wishes,

Brent Rauhut

Brent Rauhut
Program Manager, SRCO

Attachment: SPS-5 Nomination Forms

cc.w/Attach: Dr. Amir Hanna, SHRP-DC
cc.w/o Attach: Mr. Homer G. Wheeler, SHRP RE-SRCO

JBR:dmj

cc w/ attach: Mary

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

STATE FL

PROJECT LOCATION

ROUTE NUMBER 1

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

Other _____

PROJECT LOCATION Start Milepost 0 End Milepost 5.05

Start Station 77+62.6 End Station 344+64.11

PROJECT LOCATION DESCRIPTION From Martin - Palm Beach Co. line to approx. 0.5 mi. S of Jct US1/A1A in Hobe Sound. GPS test section 121030 is within the project limits in the CEL.

COUNTY MARTIN

HIGHWAY AGENCY DISTRICT NUMBER 4, Ft. Lauderdale

SHRP ENVIRONMENTAL ZONE

[ ] WET FREEZE [✓] WET NO-FREEZE [ ] DRY FREEZE [ ] DRY NO-FREEZE

SIGNIFICANT DATES

LATEST DATE OF APPROVAL NOTIFICATION FROM SHRP 7/90

CONTRACT LETTING DATE 7/91

ESTIMATED CONSTRUCTION START DATE 9/91

(Original)

PROJECT DESCRIPTION

YEAR OPENED TO TRAFFIC 1971

NUMBER OF LANES (One Direction) 2

[✓] Divided [ ] Undivided

OUTSIDE LANE WIDTH (Feet) 12

OUTSIDE SHOULDER TYPE

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

[ ] PCC [ ] Curb and Gutter Other _____

OUTSIDE SHOULDER WIDTH (Feet) NA

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

[ ] Retrofitted Retrofit Date _____

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

PREDOMINATE DISTRESSES

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

Comments _____

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

STATE FL

PAVEMENT STRUCTURE LAYER DESCRIPTIONS

LAYER[1] NO.	LAYER[2] DESCRIPTION CODE	MATERIAL TYPE[3] CLASS CODE	THICKNESS[4] (INCHES)	STRUCTURAL[5] COEFFICIENT
1	SUBGRADE (7)	57		A-3
2	06	26	6.6	0.06 LBR-20
3	06	26	6.0	0.08 LBR-40
4	05	41	8.0	0.18 Limerock
5	03	01	3.5	0.37 ☆ Ty-I
6				
7				
8				
9				

NOTES ☆ Represents design value for Type I mix. For existing pavement in "poor" condition, the layer coefficient is assumed to be 0.15.

1. Layer 1 is the natural occurring subgrade soil. The existing surface will have the largest assigned layer number.

2. Layer description codes:

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

3. Refer to Tables 1 through 4 for material class codes.

4. If subgrade depth to a rigid layer is known, enter this depth for subgrade, otherwise leave blank for subgrade layer.

5. Enter AASHTO structural layer coefficient used in pavement design or typical coefficient used by agency for this material. For the subgrade, enter either AASHTO soil support value or estimated resilient modulus.

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

STATE FL

TRAFFIC DATA

ANNUAL AVERAGE DAILY TRAFFIC (TWO DIRECTION)	18428
% HEAVY TRUCKS AND COMBINATIONS (OF AADT)	16.0
COUNT YEAR OF AADT ESTIMATE	1985
TRAFFIC GROWTH RATE SINCE PROJECT OPENED TO TRAFFIC (%/YR)	
18K ESAL RATE IN PROPOSED STUDY LANE (1,000 ESAL/YR)	
YEAR OF ESAL RATE ESTIMATE	
ESTIMATED TOTAL 18K ESAL APPLICATIONS IN STUDY LANE[1]	

REHABILITATION INFORMATION[2]

PRIMARY CAUSE FOR REHABILITATION CRACKING

OVERLAY	Thickness* (Inches)	Material Type Class Code
Surface Course	0"	
Binder Course	0"	

SURFACE PREPARATION PRIOR TO OVERLAY

[ ] Patching [ ] Crack Sealing [✓] Milling Depth of Mill 3"

Other * 3" HMAC is to be milled off and replaced with the same amount of asphalt concrete, resulting in no net overlay thickness.

OTHER CONSTRUCTION ACTIVITIES TO BE PERFORMED DURING REHABILITATION

Add Paved Shoulders.

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.

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

STATE FL

TEST SECTION LAYOUT

NUMBER OF TEST SECTIONS ENTIRELY ON FILL _____ CUT _____

SHORTEST TRANSITION BETWEEN CONSECUTIVE TEST SECTIONS (Feet) _____

COMMENTS ON DEVIATIONS FROM DESIRED SITE LOCATION CRITERIA _____

OTHER SHRP TEST SECTIONS

DOES PROJECT CONFORM TO GPS-1 OR GPS-2 PROJECT CRITERIA?	[✓] YES	[ ] NO
DOES AGENCY APPLIED TREATMENT QUALIFY FOR GPS-6B?	[ ] YES	[✓] NO*
IS PROJECT SUITABLE FOR SPS-3 TEST SECTIONS?	[ ] YES	[✓] NO
IS AGENCY INTERESTED IN USE OF PROJECT AS SPS-3 SITE?	[ ] YES	[✓] NO
DISTANCE TO NEAREST GPS TEST SECTION ON SAME ROUTE (Miles)	same project	
TEST SECTION NUMBER OF NEAREST GPS SECTION	121036	

SUPPLEMENTAL TEST SECTIONS

IF SUPPLEMENTAL EXPERIMENTAL TEST SECTIONS ARE PROPOSED, COMPLETE THE FOLLOWING

TOTAL NUMBER OF SUPPLEMENTAL TEST SECTIONS 6

FACTORS TO BE INVESTIGATED Normal Construction Method and thickness (Virgin and Florida DOT specification Recycle Mix) Different overlay thickness versus milling

* The existing GPS test section will be left as the control section if this project is selected. Otherwise, it will be overlayed and will become a GPS-6B test section.

Table 1. Pavement surface material type classification codes.

MATERIAL TYPE	CODE
Hot Mixed, Hot Laid, Asphalt Concrete, Dense graded	01
Hot Mixed, Hot Laid, Asphalt Concrete, Open Graded (Porous Friction Course)	02
Sand Asphalt	03
Jointed Plain Portland Cement Concrete	04
Jointed Reinforced Portland Cement Concrete	05
Continuously Reinforced Portland Cement Concrete	06
Prestressed Portland Cement Concrete	07
Fiber Reinforced Portland Cement Concrete	08
Plant Mix, Cold Laid, Emulsified Asphalt Material	09
Plant Mix, Cold Laid, Cutback Asphalt Material	10
Single Surface Treatment	11
Double Surface Treatment	12
Hot Recycled, Central Plant Mix, Asphalt Concrete	13
Central Plant Mix, Cold Laid, Recycled Asphalt Concrete	14
Mixed-in-place, Cold Laid, Recycled Asphalt Concrete	15
Heater Scarification/Recompaction, Recycled Asphalt Concrete	16
Jointed Plain Recycled Portland Cement Concrete	17
Jointed Reinforced Recycled Portland Cement Concrete	18
Other	20

TRDF

MEMORANDUM

TECHNICAL MEMO NO: TM-EC-54 DATE: May 23, 1990

AUTHOR: Gary E. Elkins (GEE) FILE: P1-SPS-31

DISTRIBUTION: Dr. Amir Hanna

SUBJECT: Recommendation on SPS-5 Project in Florida

I have reviewed the nomination form for the SPS-5 project in Florida recommended for acceptance by the Southern Region RCOC. The only mitigating factors in the acceptance of this section are coarse grain soil, lime rock base and addition of shoulders during overlay construction.

Although the course grained soils are not an absolute requirement, I believe that in this case another suitable project with fine grain soils probably does not exist. A good point is raised in the transmittal letter that since sections on coarse grain soils have been accepted in other environmental zones that it would be good to balance this with coarse grained projects in other environments. I recommend that you add this subdivision to your selection short, not to solicit further projects, but to discern the distribution of coarse grained projects in the experiment. This would give you better guidance with respect to acceptance decisions.

These test sections contain a lime rock base which was included in GPS only as an additional section (pollical). Although this is not a selection constraint in the SPS-5 study, its use in combined GPS-SPS analysis is somewhat reduced due to this feature.

Perhaps the most crucial feature of this project is the addition of paved shoulders during construction. This is more of a question of the detail of the paved shoulder. The concern is more over how they will pave the shoulder on the control section. The control section is currently a GPS section. The addition of paved shoulders on a GPS section is not permitted. It is also a problem if they don't add shoulders to the control section and do add shoulders to the test sections. If GPS section 121030 is to be kept in the GPS then it must not have shoulders added. Perhaps a control section could be added adjacent to the GPS section on which shoulders are added. This may not be feasible for safety considerations.

6811 Kenilworth Ave., Suite 230 • Riverdale, Maryland 20737 • (301) 779-2505 • FAX 1-301-779-2607

At the SPS-5 meeting in Phoenix we discussed the addition of shoulders. We decided to allow the addition of paved shoulders such that they do not act integrally with the lane to effectively create a widened lane. I recommend that you investigate this feature with BRE to see what compromise can be made.

In conclusion, I recommend this section for inclusion into the SPS-5 experiment, provided that the considerations on the addition of a paved shoulder can be accommodated.

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

June 6, 1990

Mr. Lawrence L. Smith, P.E.
State Materials & Research Engineer
Bureau of Materials & Research
Florida Department of Transportation
2006 N.E. Waldo Road
P.O. Box 1029
Gainesville, Florida 32602-1029

Subject: SPS-5 Nomination From District 4, Implementation Plans.

Dear Larry,

Good News! SHRP has approved the SPS-5 project nominated by District 4 (US 1, Martin County), and will monitor it.

Initially, this site will be classified as an "additional" SPS-5 project because the subgrade type differs from that required in the experiment guidelines. However, this status classification does **not** affect the data collection and storage plans and sampling, testing and performance monitoring will proceed as it would for any SPS-5 site.

Gary Fitts, of our office, is available to assist you and/or District personnel in developing the details of the experimental portions of the project. He will coordinate his schedule for the site visit and any meetings that are necessary with your office.

Thank you for your support Larry, in implementing this important study, and please contact me or Gary if you have any questions.

Sincerely,

Homer

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

cc: Cleo Marsh, FL-DOT
Brent Rauhut, PM-SRCO
Amir Hanna, SHRP-DC
Gary Elkins, TRDF-MD

HGW:dmj

Brent Rauhut Engineering Inc.

October 2, 1990

Mr. Cleo A. Marsh, P.E.
Roadway Design
State of Florida
Department of Transportation
780 Southwest 24th Street
Fort Lauderdale, Florida 33315-2696

Subject: SHRP SPS-5 Project on US-1 in Martin County.

Dear Cleo:

The attached tables summarize the sequence and limits for test sections which I am proposing for the project on US-1 in Martin County. The tables show the proposed test section locations by station and milepost to allow comparison with the plans as well as the straight-line diagrams.

I was not able to set the layout as I originally had planned due to the location of the GPS test section and the traffic monitoring equipment already on the project. This causes the layout to differ slightly from that on the Georgia project we discussed.

The test sections were arranged as shown to group the test sections with the different asphalt concrete mixes (30% RAP, "virgin") and to have a continuous area of milling. The typical "test section" is 800 ft. long (of which 500 ft. will be monitored) with 100 ft. transitions beyond each test section where the overlay thickness or surface preparation changes. This length is sufficient to make the greatest change in thickness proposed (2") without requiring a vertical curve, and therefore should pose no problem with respect to ride quality or aesthetics. No transition length is shown where a change in mix type occurs, but an extra hundred feet are added to the test section length to allow a greater lead-in to those two monitoring sections. The placement of a friction course as the finished riding surface should also help obscure any effects the changes in overlay thickness should have on these criteria. Note that the friction course is not considered as part of the overlay thickness for SPS-5 test sections.

As stated above, the sequence given in the tables is a proposed layout, and intended to be something to work from. Even if this arrangement is acceptable, we will need to confirm the section locations in the field. An example of something that needs to be checked is the location of the entrance to Jonathan Dickinson State Park with respect to the test sections. As we have discussed, I will arrange to travel there to confirm the test section locations for

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this project.

It was a pleasure meeting you and Maria, and I look forward to working with you to implement this important study. If you have any questions or comments, please contact me.

Sincerely,

Gary L. Fitts

Gary L. Fitts, P.E.
Project Engineer, SRCO

Attachments

cc: Mr. William G. Miley, FDOT-Gainesville

PROPOSED TEST SECTION LAYOUT
SHRP SPS-5, REHABILITATION OF ASPHALT CONCRETE PAVEMENTS
US-1 SBL, MARTIN CO. FLORIDA

SECTION	TREATMENT TYPE	BEGIN STATION	END STATION	TRANSITION (FT.)
120502	2" overlay (30% RAP)	280+00 (3.83)	272+00 (3.68)	100
12S501	3.5" overlay (30% RAP)	271+00 (3.66)	263+00 (3.51)	100
120503	5" overlay (30% RAP)	262+00 (3.49)	254+00 (3.34)	100
120508	Mill/inlay, 5" overlay (30% RAP)	253+00 (3.32)	245+00 (3.17)	100
12S505	Mill/inlay, 3.5" overlay (30% RAP)	244+00 (3.15)	236+00 (3.00)	100
120509	Mill/inlay, 2" overlay (30% RAP)	235+00 (2.98)	227+00 (2.83)	0
120506	Mill/inlay, 2" overlay (virgin)	227+00 (2.83)	218+00 (2.66)	100
12S504	Mill/inlay, 3.5" overlay (virgin)	217+00 (2.64)	209+00 (2.49)	100
120507	Mill/inlay, 5" overlay (virgin)	208+00 (2.47)	200+00 (2.32)	100

PROPOSED TEST SECTION LAYOUT
SHRP SPS-5, REHABILITATION OF ASPHALT CONCRETE PAVEMENTS
US-1 SBL, MARTIN CO. FLORIDA (CONTINUED)

SECTION	TREATMENT TYPE	BEGIN STATION (MP)	END STATION (MP)	TRANSITION (FT.)
120504	5" overlay (virgin)	199+00 (2.30)	191+00 (2.15)	100
12S502	3.5" overlay (virgin)	190+00 (2.13)	182+00 (1.98)	100
120505	2" overlay (virgin)	181+00 (1.96)	173+00 (1.81)	100
120501 (121030)	Routine maintenance (control and GPS)	172+00 (1.79)	164+00 (1.64)	100
12S503	Mill/inlay (virgin)	163+00 (1.62)	155+00 (1.47)	0
12S504	Mill/inlay (RAP)	155+00 (1.47)	146+00 (1.29)	100
120510	Planned construction	145+00	137+00	---

NOTES

1. There is a discrepancy between what the plans and the straight-line diagram show for the location for the entrance to Jonathan Dickinson State Park. If the SLD is correct, the test section limits given in the tables will likely be modified to simplify the construction of the turn lane and acceleration lane at that location.

2. The station limits shown indicate the extent of the appropriate treatment according to centerline stationing. The transition length is the distance over which the overlay thickness or milling depth varies between test sections.

3. Sections which are included in the experimental design for SPS-5 are indicated by the SHRP ID numbers with a zero (0) as the third character from the left. The other sections are supplementary to the study and are assigned SHRP ID numbers with the letter "S" as the third character from the left.

4. The entire project, except for the control section, will receive a 0.75 in. porous friction course. This is not considered to be a part of the overlay thickness.

5. While the addition of a paved (OBG-16) shoulder is acceptable for the sections receiving some type of treatment, it would be preferable <u>not</u> to add a paved outside shoulder to the GPS/control section.

FLORIDA DEPARTMENT OF TRANSPORTATIO

BOB MARTINEZ
GOVERNOR

BEN G. WATTS
SECRETARY

780 Southwest 24 Street,
Fort Lauderdale,
Florida 33315-2696
Telephone: (305) 524-8621

October 12, 1990

Mr. Gary Fitts, P.E.
Brent Rauhut Engineering Inc.,
8240 Mopac, Suite 220,
Austin, Texas 78759

Dear Gary,

SUBJECT : SHRP SPS-5 Project
State Road No..... 5 (US-1)
W.P.I. No..... 4116248
State Project No... 89010-3553
F.A.P. No..... F-485-5(35)
County ..... Martin
Description ..... From M.P. 0.00 to M.P. 5.40

Attached is an adjusted list of the proposed locations of the test sites with locations of existing turnouts. The test site locations were revised from your original proposal to avoid the entrances to Jonathan Dickinson State Park.

I would like to confirm that November 1-2 is convenient for me to assist in marking out the test sections. If this time does not suit you please do not hesitate to contact me ((305) 524-8621 ext 347 or 348).

Sincerely,

Cleo Marsh, P.E.
Design Section 3

cc: Mr. William Miley, Bureau of Materials & Research

PROPOSED TEST SECTION LAYOUT
SHRP SPS-5, REHABILITATION OF ASPHALT CONCRETE PAVEMENTS
US-1 SBL, MARTIN COUNTY FLORIDA

SECTION	TREATMENT TYPE	BEGIN STATION	END STATION	TRANSITION (FT.)
	U.S. COAST GUARD STATION ENTRANCE			
	Sta. 331+52 (4.621) to Sta. 320+71 (4.825) (includes tapers)			
120502	2" overlay (30% RAP)	319+00 (4.589)	311+00 (4.437)	100
12S501	3.5" overlay (30% RAP)	310+00 (4.418)	302+00 (4.267)	100
120503	5" overlay (30% RAP)	301+00 (4.248)	293+00 (4.096)	
	JONATHAN DICKINSON PARK ENTRANCE (MAINTENANCE)			
	Sta. 292+62 (4.089) to Sta. 281+50 (3.878) (includes tapers)			
120508	Mill/inlay 5" overlay (30% RAP)	281+00 (3.869)	273+00 (3.717)	100
12S505	Mill/inlay 3.5" overlay (30% RAP)	272+00 (3.699)	264+00 (3.547)	100
120509	Mill/inlay 2" overlay (30% RAP)	263+00 (3.528)	255+00 (3.377)	100
120506	Mill/inlay 2" overlay (virgin)	~~254+00~~ (3.358)	~~246+00~~ (3.187)	100
12S504	Mill/inlay 3.5" overlay (virgin)	245+00 (3.187)	237+00 (3.036)	100
120507	Mill/inlay 5" overlay (virgin)	236+00 (3.017)	228+00 (2.865)	100
120504	5" overlay (virgin)	227+00 (2.846)	219+00 (2.695)	100
12S502	3.5" overlay (virgin)	218+00 (2.676)	210+00 (2.524)	100

PROPOSED TEST SECTION LAYOUT
SHRP SPS-5, REHABILITATION OF ASPHALT CONCRETE PAVEMENTS
US-1 SBL, MARTIN COUNTY FLORIDA

SECTION	TREATMENT TYPE	BEGIN STATION	END STATION	TRANSITION (FT.)
	JONATHAN DICKINSON PARK ENTRANCE M.P. 2.522 to M.P. 2.436 (includes tapers)			
120505	2" overlay (virgin)	199+00 (2.316)	191+00 (2.164)	100
12S503	Mill/inlay (virgin)	190+00 (2.145)	182+00 (1.994)	100
12S504	Mill/inlay (RAP)	181+00 (1.975)	173+00 (1.824)	100
120501 (121030)	Routine Maintenance (Control and GPS)	172+00 (1.805)	164+00 (1.653)	
120510	Planned Construction	164+00	76+72	
	JUPITER HILLS CLUB ENTRANCE M.P. 1.390 to M.P. 1.274 (includes tapers)			

Brent Rauhut Engineering Inc.

November 12, 1990

Mr. Cleo A. Marsh, P.E.
Roadway Design
State of Florida
Department of Transportation
780 Southwest 24th Street
Fort Lauderdale, Florida 33315-2696

Subject: SHRP SPS-5 Project on US-1 in Martin County.

Dear Cleo,

The enclosed tables include the section identification numbers and limits of the rehabilitation treatments included in the SHRP SPS-5 experiment and for treatments which supplement the experiment. This has been revised based on what was marked on the roadway during our site visit of November 1 and 2, 1990.

On the project, the 500 ft. long sections which will be monitored have been marked and numbered with white spray paint and traffic tape. The tape was applied across the outside lane at the beginning and end of each of the monitored sections. Painted hash marks were placed at each station within the monitored sections, and were also placed at the beginning and end points of the test sections, as indicated in the tables.

As we have discussed, the typical test section is 800 ft. long with 100 ft. gaps between test sections for making transitions in thicknesses or surface preparation. Exceptions to this include sections which border the Coast Guard Station or Jonathan Dickinson Park entrances and where the mix type changes.

Thanks again for your cooperation in implementing this study. If there is any problem with this schedule of test sections, or if there are any questions or comments which need to be addressed, please do not hesitate to contact me.

Sincerely,

Gary L. Fitts

Gary L. Fitts, P.E.
Project Engineer, SRCO

Attachments

8240 Monar, Suite 220 • Austin, Texas • (512) 346-0870 • FAX (512) 346-8750

cc: Mr. William G. Miley, FDOT-Gainesville
Dr. Shiraz Tayabji, PCS/Law
Dr. Amir Hanna, SHRP-DC

/glf

TEST SECTION LAYOUT
SHRP SPS-5, REHABILITATION OF ASPHALT CONCRETE PAVEMENTS
US-1 SBL, MARTIN CO. FLORIDA

SECTION	TREATMENT TYPE	BEGIN STATION	END STATION	TRANSITION (FT.)
120502	2" overlay (30% RAP)	341+00 (5.004)	320+00 (4.607)	100
	U.S. COAST GUARD STATION ENTRANCE Sta. 331+52 (4.825) to Sta. 320+71 (4.621) (includes tapers)			
12S501	3.5" overlay (30% RAP)	319+00 (4.589)	311+00 (4.437)	100
120503	5" overlay (30% RAP)	310+00 (4.418)	302+00 (4.267)	100
120508	Mill/inlay, 5" overlay (30% RAP)	301+00 (4.248)	294+00 (4.115)	100
	JONATHAN DICKINSON PARK ENTRANCE (MAINTENANCE) Sta. 292+62 (4.089) to Sta. 281+50 (3.878) (includes tapers)			
	CURVE P.C. 3.878, P.I. 3.892, P.T. 3.996			
12S505	Mill/inlay, 3.5" overlay (30% RAP)	293+00 (4.096)	274+00 (3.736)	100
120509	Mill/inlay, 2" overlay (30% RAP)	273+00 (3.717)	265+00 (3.566)	0
120506	Mill/inlay, 2" overlay (virgin)	265+00 (3.566)	255+00 (3.377)	100

TEST SECTION LAYOUT
SHRP SPS-5, REHABILITATION OF ASPHALT CONCRETE PAVEMENTS
US-1 SBL, MARTIN CO. FLORIDA (CONTINUED)

SECTION	TREATMENT TYPE	BEGIN STATION (MP)	END STATION (MP)	TRANSITION (FT.)
12S506	Mill/inlay, 3.5" overlay (virgin)	254+00 (3.358)	247+00 (3.225)	100
120507	Mill/inlay, 5" overlay (virgin)	246+00 (3.206)	238+00 (3.055)	100
120504	5" overlay (virgin)	237+00 (3.036)	229+00 (2.884)	100
12S502	3.5" overlay (virgin)	228+00 (2.865)	220+00 (2.714)	100
120505	2" overlay (virgin)	219+00 (2.695)	211+00 (2.542)	100
	JONATHAN DICKINSON PARK ENTRANCE M.P. 2.522 to M.P. 2.436 (includes tapers)			
12S503	Mill/inlay (virgin)	200+00 (2.335)	192+00 (2.183)	100
12S504	Mill/inlay (RAP)	191+00 (2.164)	183+00 (2.013)	100
121030	Routine maintenance (control and GPS)	182+00 (1.994)	163+55 (1.644)	---
120510	Planned construction	163+55	76+72	---

NOTES

1. The station limits shown indicate the extent of the designated treatment type according to centerline stationing and milemark. The transition length is the distance over which the overlay thickness or milling depth varies between test sections. The 500 ft. sections to be monitored typically are preceded by 200 ft. of "lead-in" and followed by 100 ft. of the same typical section.

2. Sections which are included in the experimental design for SPS-5 are indicated by the SHRP ID numbers with a zero (0) as the third character from the left. The other sections are supplementary to the study and are assigned SHRP ID numbers with the letter "S" as the third character from the left.

3. The entire project, except for the GPS/control section, will receive a 0.75 in. porous friction course. This is not considered to be a part of the overlay thickness.

4. While the addition of a paved (OBG-16) outside shoulder is acceptable for the sections receiving some type of treatment, it would be preferable not to add a paved outside shoulder to the GPS/control section.

THIS CONTRACT PLAN SET INCLUDES

ROADWAY PLANS
SUMMARY OF PAY ITEMS (03 SHEETS)
SIGNING AND PAVEMENT MARKING PLANS

A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT SET OF PLANS

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	TYPICAL SECTIONS
3	ROADWAY PAVEMENT CONSTRUCTION
	THROUGH TEST SECTIONS PLAN
4 & 5	TEST SECTION PROFILES
6	TABULATION OF QUANTITIES AND
	GENERAL NOTES
7	DETAILS
8 - 18	ROADWAY PLANS
19	TRAFFIC CONTROL PLAN
20	SCHEMATIC LAYOUT OF MEDIAN CROSSOVER
21	STORM WATER POLLUTION PREVENTION PLAN

90% SUBMITTAL

THESE PLANS HAVE BEEN PREPARED IN ACCORDANCE WITH AND ARE GOVERNED BY THE STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION, ROADWAY AND TRAFFIC DESIGN STANDARDS BOOKLET DATED JANUARY, 1992.

REVISIONS

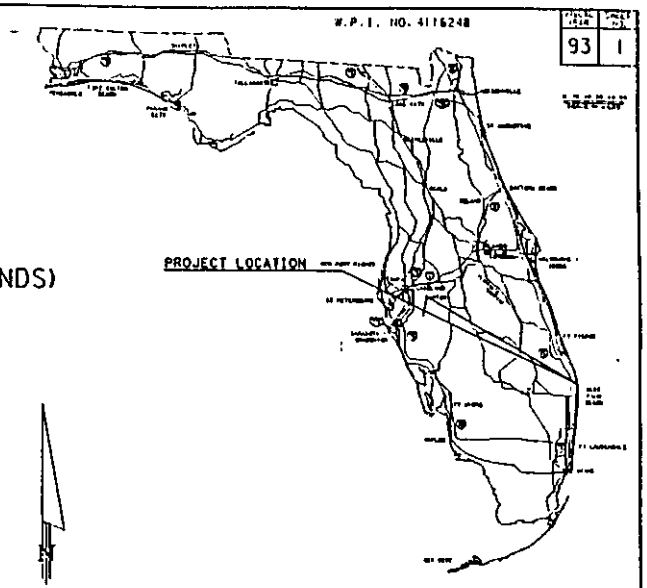
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

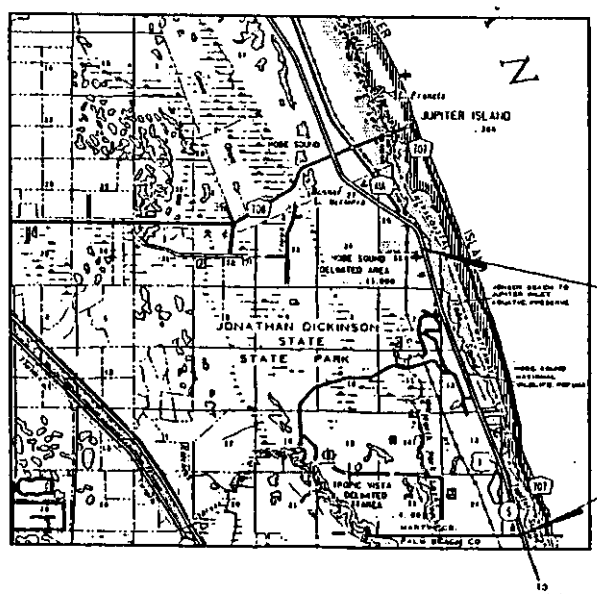
PLANS OF PROPOSED
STATE HIGHWAY

STATE PROJECT NO. 89010-3553 (FEDERAL FUNDS)
MARTIN COUNTY
STATE ROAD NO. 5
(US-1)

W.P.I. NO. 4116248

SHEET NO.	TOTAL SHEETS
93	1





ROADWAY PLANS
ENGINEER OF RECORD
LAWSON, NOBLE AND ASSOCIATES
420 COLUMBIA DRIVE
WEST PALM BEACH, FLORIDA 33409
CHRISTOPHER J. KAFER, JR. P.E.

PLANS PREPARED BY :
LAWSON, NOBLE AND ASSOCIATES
420 COLUMBIA DRIVE
WEST PALM BEACH, FLORIDA 33409

NOTE: THIS PROJECT WAS DESIGNED TO MEET FDOT A-A-R CRITERIA

ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN REDUCED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA.

GOVERNING SPECIFICATIONS: STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS, DATED 1991 AND SUPPLEMENTS THERETO IF NOTED IN THE SPECIAL PROVISIONS FOR THIS PROJECT.

LENGTH OF PROJECT

	LINEAR FT.	MILES
ROADWAY	26,659	5.049
BRIDGES	0	0
NET LENGTH OF PROJ.	26,659	5.049
EXCEPTIONS	0	0
GROSS LENGTH OF PROJ.	26,659	5.049

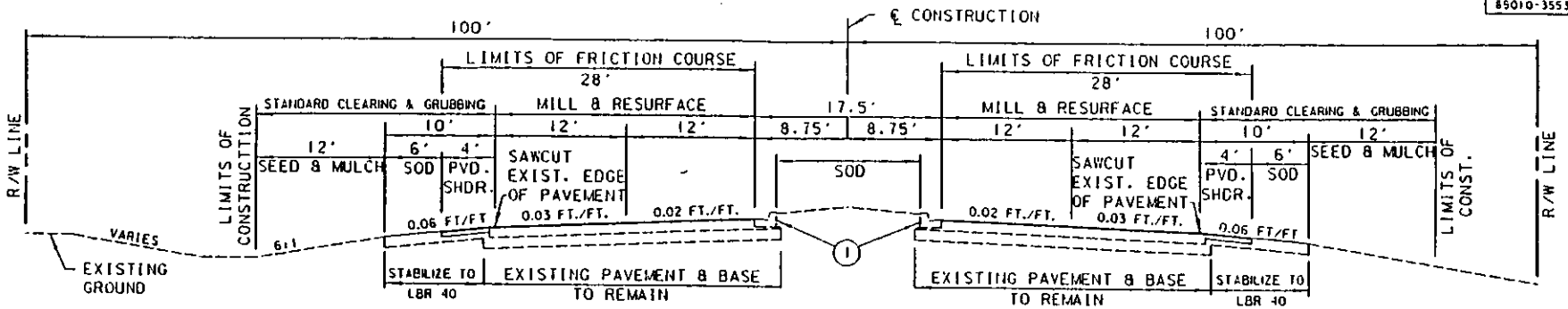
REVISIONS		
DATE	BY	DESCRIPTION

ROADWAY PLANS APPROVED BY: CHRISTOPHER J. KAFER, JR. P.E.
DATE:
P.E. NO. 28334

FDOT PROJECT MANAGER : EDWARD YUE, P.E.

A.25

STATE PROJ. NO.	SHEET NO.
89010-3553	2



TYPICAL SECTION NOTES

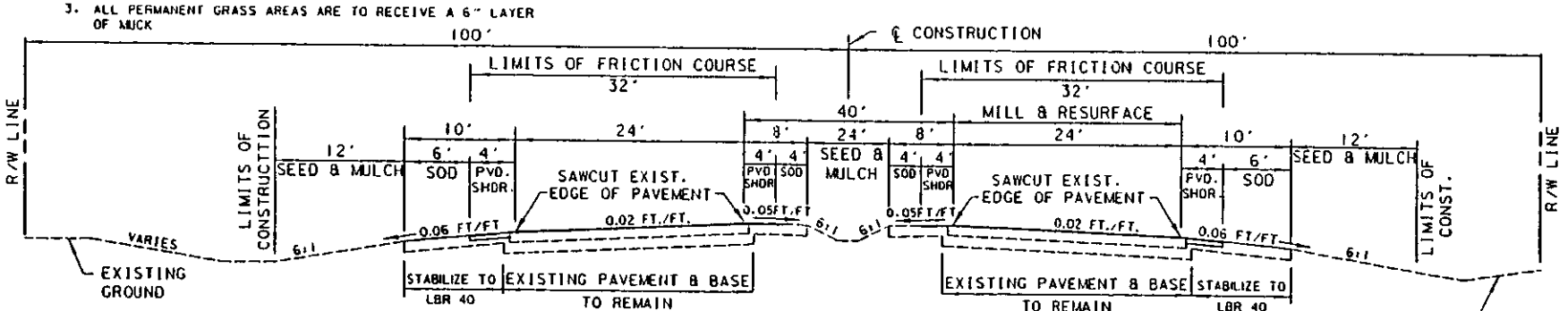
1. PAVEMENT SHALL BE SAWCUT AT THE BEGINNING AND END OF THE MILLING AREA
2. THE PAVEMENT DESIGN BELOW IS TO BE USED FOR THE NORTHBOUND LANES AND THOSE PARTS OF THE SOUTHBOUND LANES NOT INCLUDED IN THE SHRP (STRATEGIC HIGHWAY REASEARCH PROGRAM) TEST SECTIONS. THE PAVEMENT DESIGN FOR ALL TEST SECTIONS ON THE SOUTHBOUND LANES WILL BE AS NOTED ON THE TEST SECTION PROFILE SHEETS.
3. ALL PERMANENT GRASS AREAS ARE TO RECEIVE A 6" LAYER OF MUCK

M.P. 0.000 TO M.P. 0.609 (NORTHBOUND & SOUTHBOUND)
M.P. 0.609 TO M.P. 0.808 (NORTHBOUND & SOUTHBOUND)

MEDIAN WIDTH TRANSITION
DESIGN SPEED 40 MPH
POSTED SPEED 45 MPH

(1) EXISTING TYPE "F" CURB & GUTTER TO REMAIN

NOTE:
EXISTING FRONTAGE ROADS HAVE NOT BEEN SHOWN AND ARE NOT A PART OF THIS CONTRACT



M.P. 0.808 TO M.P. 5.049 (NORTHBOUND)
M.P. 0.808 TO M.P. 1.6302 (SOUTHBOUND)

TRAFFIC DATA			
EST.	1994	A.D.T.	18300
EST.	2009	A.D.T.	27100
EST.	2014	A.D.T.	30100
K-9.48%		D-60.42%	T-2.7%

DESIGN SPEED 65 MPH POSTED SPEED 55 MPH

ROADWAY PAVEMENT CONSTRUCTION

MILL EXISTING ASPHALTIC CONCRETE PAVEMENT (2 1/2" DEPTH). RESURFACE WITH TYPE "S" STRUCTURAL COURSE (200 LBS./S.Y. AVG.) WITH FRICTION COURSE TYPE FC-2 (5/8" THICK)

SHOULDER PAVEMENT NEW CONSTRUCTION

TYPE "S" STRUCTURAL COURSE (200 LBS./S.Y. AVG.) WITH FRICTION COURSE TYPE FC-2 (5/8" THICK) ON OPTIONAL BASE GROUP 16 ON 12" STABILIZED SUBGRADE (LBR 40)

NOTE:
THE PAVEMENT & SHOULDERS SHALL BE PAVED WITH ONE LIFT OF TYPE "S" STRUCTURAL COURSE (2" THICK) PRIOR TO OPENING TO TRAFFIC.

NOTE:
ALL EXISTING TYPE "E" CURB IS TO BE REMOVED

REVISIONS												
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

	NAME	DATE		NAME	DATE
DESIGNED BY	JPD	01-93	DRAWN BY	RB	01-93
CHECKED BY	CJK	01-93	CHECKED BY	JPD	01-93
SUPERVISED BY C.J. KAFER					

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY
DATE

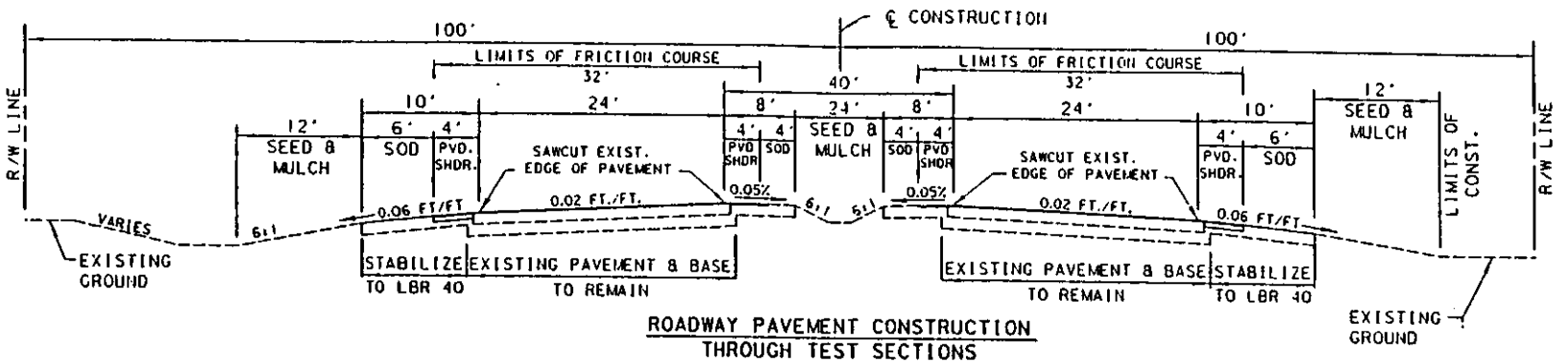
LNA

TYPICAL SECTION
S.R. 5

92-203/TYPSR005

A.26

STATE PROJ. NO.	SHEET
89010-3553	3



ROADWAY PAVEMENT CONSTRUCTION THROUGH TEST SECTIONS

SOUTHBOUND

MILEPOST	1.6302	NO MILLING OR RESURFACING PROPOSED.
TO	1.8673	PAVEMENT TO REMAIN IN EXISTING
INCLUDES	TEST	CONDITION. * SHOULDERS TO BE ADDED
SECTION	121030	TO BOTH SIDES
MILEPOST	1.8673	PAVEMENT SHALL BE MILLED 2.5" &
TO	2.1118	INLAYED WITH 2.5" (30% RAP)
INCLUDES	TEST	
SECTION	120554	
MILEPOST	2.1118	PAVEMENT SHALL BE MILLED 2.5" &
TO	2.2822	INLAYED WITH 2.5" (VIRGIN)
INCLUDES	TEST	
SECTION	120553	
MILEPOST	2.2822	SEE NORTHBOUND PAVEMENT DESIGN
TO	2.4716	
MILEPOST	2.4716	TRANSITION
TO	2.5095	
MILEPOST	2.5095	MILL FRICTION COURSE ONLY. OVERLAY
TO	2.6610	PAVEMENT WITH 2" (VIRGIN)
INCLUDES	TEST	
SECTION	120505	
MILEPOST	2.6610	TRANSITION
TO	2.6987	
MILEPOST	2.6987	MILL FRICTION COURSE ONLY. OVERLAY
TO	2.8313	PAVEMENT WITH 3.5" (VIRGIN)
INCLUDES	TEST	
SECTION	120552	
MILEPOST	2.8313	TRANSITION
TO	2.8690	
MILEPOST	2.8690	MILL FRICTION COURSE ONLY. OVERLAY
TO	3.0207	PAVEMENT WITH 5" (VIRGIN)
INCLUDES	TEST	
SECTION	120504	
MILEPOST	3.0207	PAVEMENT SHALL BE MILLED 2.5" &
TO	3.1722	INLAYED WITH 2.5" (VIRGIN)
INCLUDES	TEST	OVERLAY PAVEMENT WITH 5" (VIRGIN)
SECTION	120507	

SOUTHBOUND

MILEPOST	3.1722	TRANSITION
TO	3.2099	
MILEPOST	3.2099	PAVEMENT SHALL BE MILLED 2.5" &
TO	3.3424	INLAYED WITH 2.5" (VIRGIN)
INCLUDES	TEST	OVERLAY PAVEMENT WITH 3.5" (VIRGIN)
SECTION	120556	
MILEPOST	3.3424	TRANSITION
TO	3.3614	
MILEPOST	3.3614	PAVEMENT SHALL BE MILLED 2.5" &
TO	3.5220	INLAYED WITH 2.5" (VIRGIN)
INCLUDES	TEST	OVERLAY PAVEMENT WITH 2" (VIRGIN)
SECTION	120506	
MILEPOST	3.5220	STAGGER INLAY & OVERLAY
TO	3.5296	
MILEPOST	3.5296	PAVEMENT SHALL BE MILLED 2.5" &
TO	3.6829	INLAYED WITH 2.5" (30% RAP)
INCLUDES	TEST	OVERLAY PAVEMENT WITH 2" (30% RAP)
SECTION	120509	
MILEPOST	3.6829	TRANSITION
TO	3.7204	
MILEPOST	3.7204	PAVEMENT SHALL BE MILLED 2.5" &
TO	3.8720	INLAYED WITH 2.5" (30% RAP), OVERLAY
INCLUDES	TEST	PAVEMENT WITH 3.5" (30% RAP)
SECTION	120555	
MILEPOST	3.8720	TRANSITION
TO	3.9099	
MILEPOST	3.9099	SEE NORTHBOUND PAVEMENT DESIGN
TO	4.0322	
MILEPOST	4.0322	TRANSITION
TO	4.0795	
MILEPOST	4.0795	PAVEMENT SHALL BE MILLED 2.5" &
TO	4.2407	INLAYED WITH 2.5" (30% RAP)
INCLUDES	TEST	OVERLAY PAVEMENT WITH 5" (30% RAP)
SECTION	120508	

SOUTHBOUND

MILEPOST	4.2407	MILL FRICTION COURSE ONLY. OVERLAY
TO	4.3834	PAVEMENT WITH 5" (30% RAP)
INCLUDES	TEST	
SECTION	120503	
MILEPOST	4.3834	TRANSITION
TO	4.4224	
MILEPOST	4.4224	MILL FRICTION COURSE ONLY. OVERLAY
TO	4.5549	PAVEMENT WITH 3.5" (30% RAP)
INCLUDES	TEST	
SECTION	120551	
MILEPOST	4.5549	TRANSITION
TO	4.5928	
MILEPOST	4.5928	SEE NORTHBOUND PAVEMENT DESIGN
TO	4.8002	
MILEPOST	4.8002	TRANSITION
TO	4.8191	
MILEPOST	4.8191	MILL FRICTION COURSE ONLY. OVERLAY
TO	4.9706	PAVEMENT WITH 2" (30% RAP)
INCLUDES	TEST	
SECTION	120502	
MILEPOST	4.9706	TRANSITION
TO	5.0085	
MILEPOST	5.0085	SEE NORTHBOUND PAVEMENT DESIGN
TO	5.0490	

NORTHBOUND

MILEPOST	0.0000	MILL EXISTING ASPHALTIC CONCRETE
TO	5.0490	PAVEMENT (2.5" DEPTH). RESURFACE WITH TYPE "S" STRUCTURAL COURSE (200 LBS./S.Y. AVG.) WITH FRICTION COURSE TYPE FC-2 (5/8" THICK)

NOTE:
ASPHALTIC CONCRETE IN THE TEST SECTIONS SHALL BE TYPE "S" OR RECYCLED TYPE "S" ACCORDING TO F.D.O.T. SPECIFICATIONS (1991) AND THE SPECIAL PROVISIONS.

SHOULDER PAVEMENT NEW CONSTRUCTION

TYPE "S" STRUCTURAL COURSE (200 LBS./S.Y. AVG.) WITH FRICTION COURSE TYPE FC-2 (5/8" THICK) ON OPTIONAL BASE GROUP 16 ON 12" STABILIZED SUBGRADE (LBR 40)

REVISIONS												
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

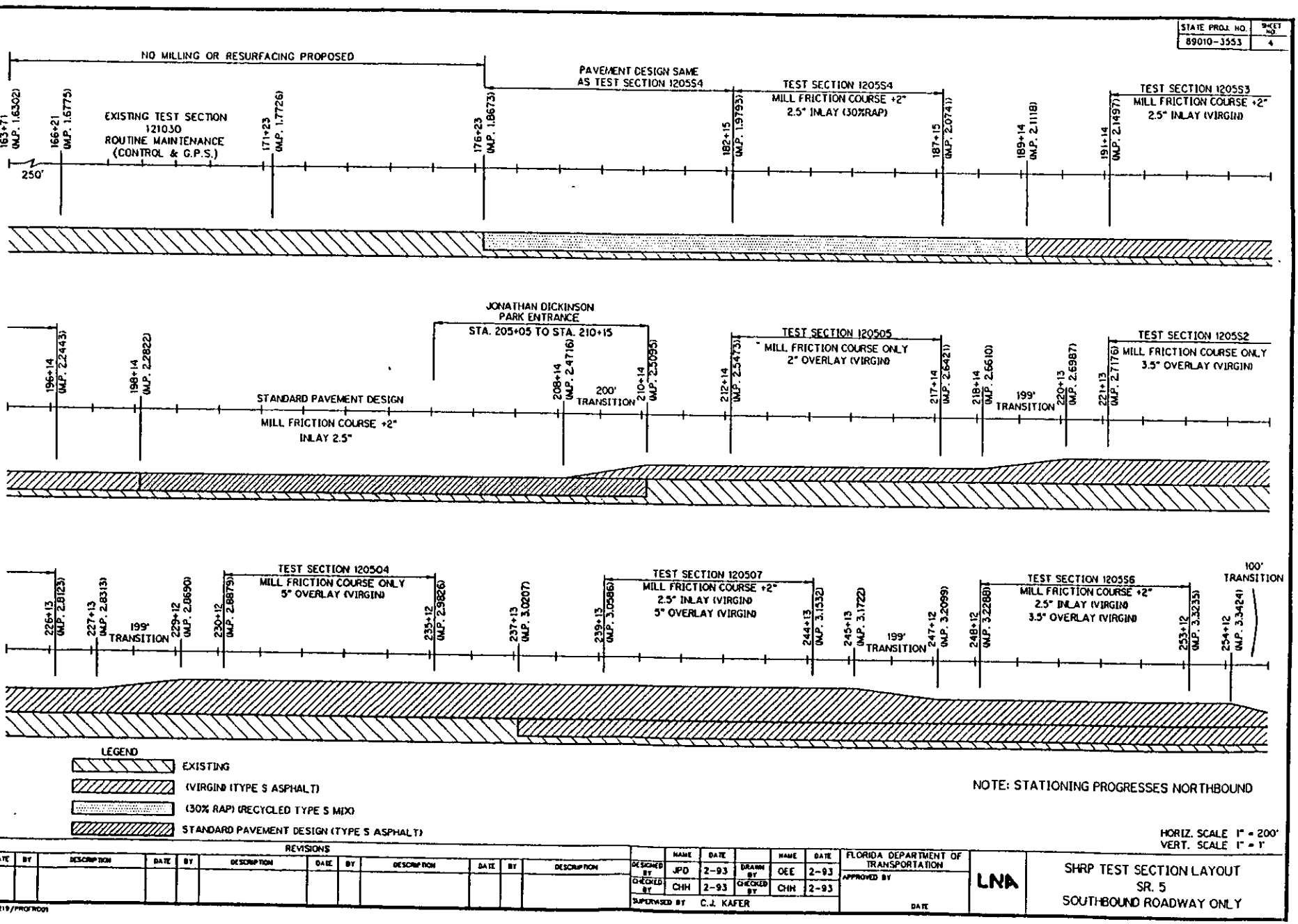
	NAME	DATE		NAME	DATE
DESIGNED BY	JPD	01-93	DRAWN BY	AB	01-93
CHECKED BY	CJK	01-93	CHECKED BY	JPD	01-93

SUPERVISED BY C. J. KAFER

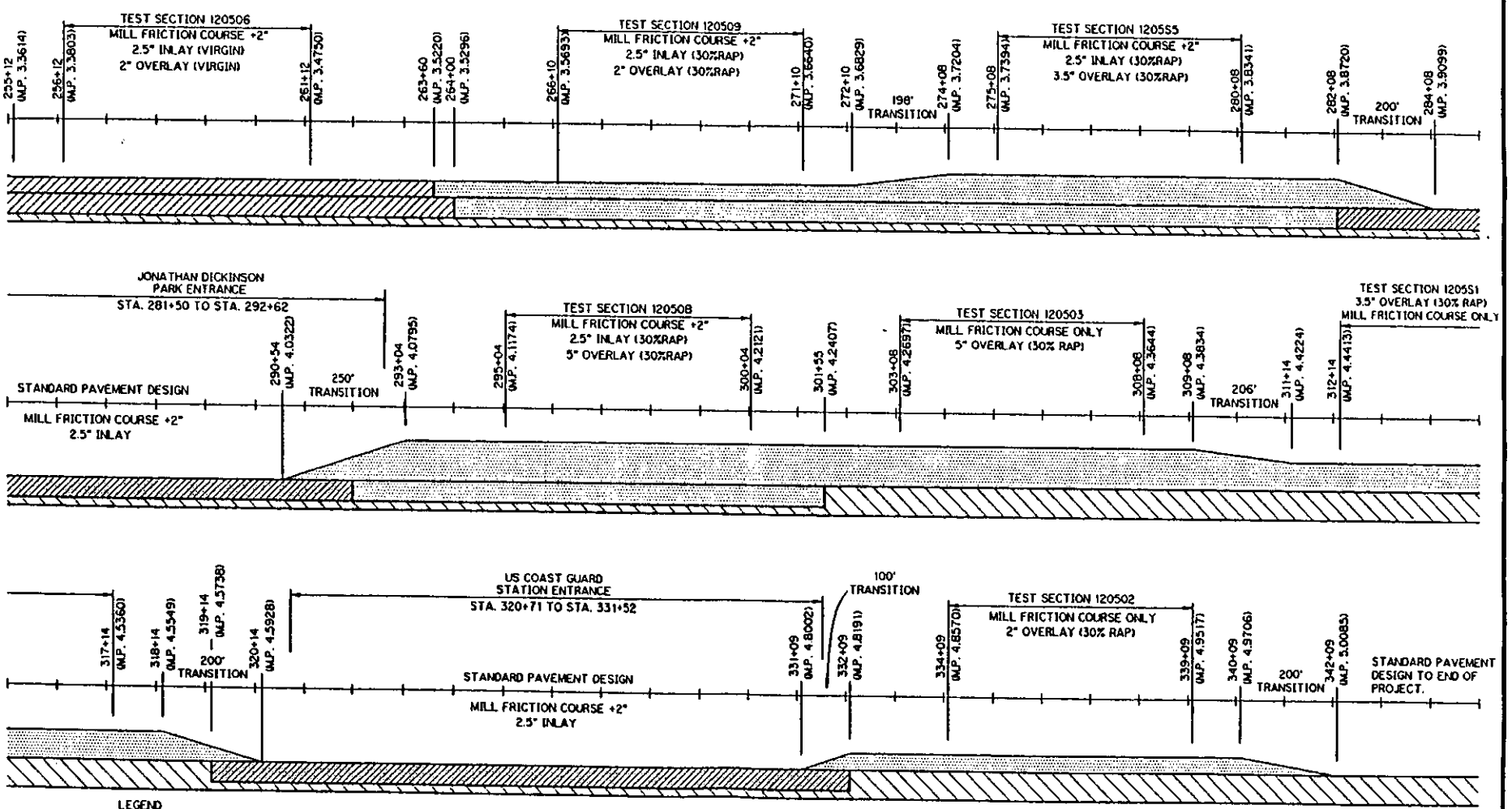
FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY
DATE

LNA

ROADWAY PAVEMENT CONSTRUCTION THROUGH TEST SECTIONS SR5


STATE PROJ. NO. 89010-3553
SHEET NO. 4
NO MILLING OR RESURFACING PROPOSED
PAVEMENT DESIGN SAME AS TEST SECTION 120554
TEST SECTION 120554
MILL FRICTION COURSE +2"
2.5" INLAY (30%RAP)
TEST SECTION 120553
MILL FRICTION COURSE +2"
2.5" INLAY (VIRGIN)
163+71 (M.P. 1.6302)
166+21 (M.P. 1.6775)
EXISTING TEST SECTION
121030
ROUTINE MAINTENANCE
(CONTROL & G.P.S.)
250'
171+23 (M.P. 1.7726)
176+23 (M.P. 1.8673)
182+15 (M.P. 1.9793)
187+15 (M.P. 2.0741)
189+14 (M.P. 2.1118)
191+14 (M.P. 2.1497)
JONATHAN DICKINSON
PARK ENTRANCE
STA. 205+05 TO STA. 210+15
TEST SECTION 120505
MILL FRICTION COURSE ONLY
2" OVERLAY (VIRGIN)
TEST SECTION 120552
MILL FRICTION COURSE ONLY
3.5" OVERLAY (VIRGIN)
196+14 (M.P. 2.2443)
198+14 (M.P. 2.2822)
STANDARD PAVEMENT DESIGN
MILL FRICTION COURSE +2"
INLAY 2.5"
208+14 (M.P. 2.4716)
200' TRANSITION
210+14 (M.P. 2.5095)
212+14 (M.P. 2.5473)
217+14 (M.P. 2.6421)
218+14 (M.P. 2.6610)
199' TRANSITION
220+13 (M.P. 2.6987)
221+13 (M.P. 2.7176)
TEST SECTION 120504
MILL FRICTION COURSE ONLY
5" OVERLAY (VIRGIN)
TEST SECTION 120507
MILL FRICTION COURSE +2"
2.5" INLAY (VIRGIN)
5" OVERLAY (VIRGIN)
TEST SECTION 120556
MILL FRICTION COURSE +2"
2.5" INLAY (VIRGIN)
3.5" OVERLAY (VIRGIN)
100' TRANSITION
226+13 (M.P. 2.8123)
227+13 (M.P. 2.8313)
199' TRANSITION
229+12 (M.P. 2.8690)
230+12 (M.P. 2.8879)
235+12 (M.P. 2.9826)
237+13 (M.P. 3.0207)
239+13 (M.P. 3.0586)
244+13 (M.P. 3.1532)
245+13 (M.P. 3.1722)
199' TRANSITION
247+12 (M.P. 3.2099)
248+12 (M.P. 3.2288)
253+12 (M.P. 3.3235)
254+12 (M.P. 3.3424)
LEGEND
EXISTING
(VIRGIN) (TYPE S ASPHALT)
(30% RAP) (RECYCLED TYPE S MIX)
STANDARD PAVEMENT DESIGN (TYPE S ASPHALT)
NOTE: STATIONING PROGRESSES NORTHBOUND
HORIZ. SCALE 1" = 200'
VERT. SCALE 1" = 1'
REVISIONS
DATE BY DESCRIPTION
DESIGNED BY JPD 2-93
DRAWN BY OEE 2-93
CHECKED BY CHH 2-93
CHECKED BY CHH 2-93
SUPERVISED BY C.J. KAFER
FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY
DATE
LNA
SHRP TEST SECTION LAYOUT
SR. 5
SOUTHBOUND ROADWAY ONLY
92-219/PROTROD1

STATE PROJ NO.	SHEET NO.
89010-3553	5



LEGEND

- EXISTING
- (VIRGIN (TYPE S ASPHALT)
- (30% RAP) (RECYCLED TYPE S MIX)
- STANDARD PAVEMENT DESIGN (TYPE S ASPHALT)

NOTE: STATIONING PROGRESSES NORTHBOUND

HORIZ. SCALE 1" = 200'
VERT. SCALE 1" = 1'

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	JPD	2-93	DRAWN BY	OEE	2-93
CHECKED BY	CHH	2-93	CHECKED BY	CHH	2-93

SUPERVISED BY C.J. KAFER

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY
DATE

LNA

SHRP TEST SECTION LAYOUT
SR. 5
SOUTHBOUND ROADWAY ONLY

92-218/PROFROO2

RECEIVED SEP 1 2 1994

KCA

KISINGER CAMPO
and associates corp

engineers • planners • land surveyors

ALLEN F. KISINGER, P.L.S.
(1904–1981)

NAME	INFO	ACTN	COPY
GR			
MG			
MR			
MS			✓
R-File			
File:			

Mr. James R. Widmann
Dickerson Florida, Inc.
3340 S.E. Divie Highway
P.O. Box 719
Stuart, FL 34995

RE: PRECONSTRUCTION CONFERENCE

Work Program Item No:	4116248
State Job Number:	89010-3553
Federal Job Number:	F-485-5(35)
County:	Martin
Description:	SR 5/US 1 From Palm Beach County line to FEC RR Bridge; Hobe Sound

Dear Sirs,

A pre-construction conference will be held at the Chamber of Commerce, 1650 South Kenner Highway, Stuart, Florida on September 23rd at 10:00am to discuss construction scheduling, utility adjustments, E.E.O. requirements and other related matters.

Please submit in writing, at this time, a CPM Schedule and Work Plan in accordance with Article 8-3.2 of the 1991 Standard Specifications. Both will be approved at the Resident and District levels.

Please have the E.E.O. officers of your company or someone knowledgeable of E.E.O. rules and regulations present so that procedures and administrative matters can be discussed.

I am attaching Form 275-010-15 and other E.E.O. instructions for your completion prior to the meeting. This should include a completed company-wide Form 275-010-12, your EEO/Affirmative Action Plan and your DBE/Affirmative Action Plan, all to be submitted at the conference.

Please be advised that all of the EEO requirements listed above are required of each subcontractor whose contract exceeds $10,000, and must be submitted and approved prior to any individual company beginning work.

Home Office/P.O. Box 25261 • Tampa, Florida • 33622-5261
2203 N. Lois Avenue • Suite 410 • Tampa, Florida 33607 • 813/871-5331 • FAX: 813/871-5135
535 A&B Lane • Tallahassee, Florida 32303 • 904/385-8800 • FAX: 904/386-2298

Please prepare and submit your special plan in detail for the prevention, control, and abatement of erosion and water pollution in accordance with the contract Special Provisions page 19A *including attachments and Plan Sheet No. 22-30.*

Please submit your Maintenance of Traffic Plan in writing for the mainline and all approaches. This should include a plan sheet on which will be indicated the type and location of all signs, lights and barricades. You may use the Manual on Uniform Traffic Control Devices (MUTCD) and the 600 Series Roadway Design Standards as a guide.

If you intend to utilize the Traffic Control Plan outline in the plans, please submit a copy of that indicating your intention under separate cover letter.

Please have in attendance the individual who will be preparing your subcontracts for submittal to the District Office for approval. Each subcontractor must be approved prior to that sub beginning work.

Please have your subcontractors attend this meeting if possible

Sincerely,

Carson Carner

Carson Carner
Area Manager

Home Office/P.O. Box 25261 • Tampa, Florida • 33622-5261
2203 N. Lois Avenue • Suite 410 • Tampa, Florida 33607 • 813/871-5331 • FAX: 813/871-5135
535 A&B ane • Tallahassee, Florida 32303 • 904/385-8800 • FAX: 904/386-2298

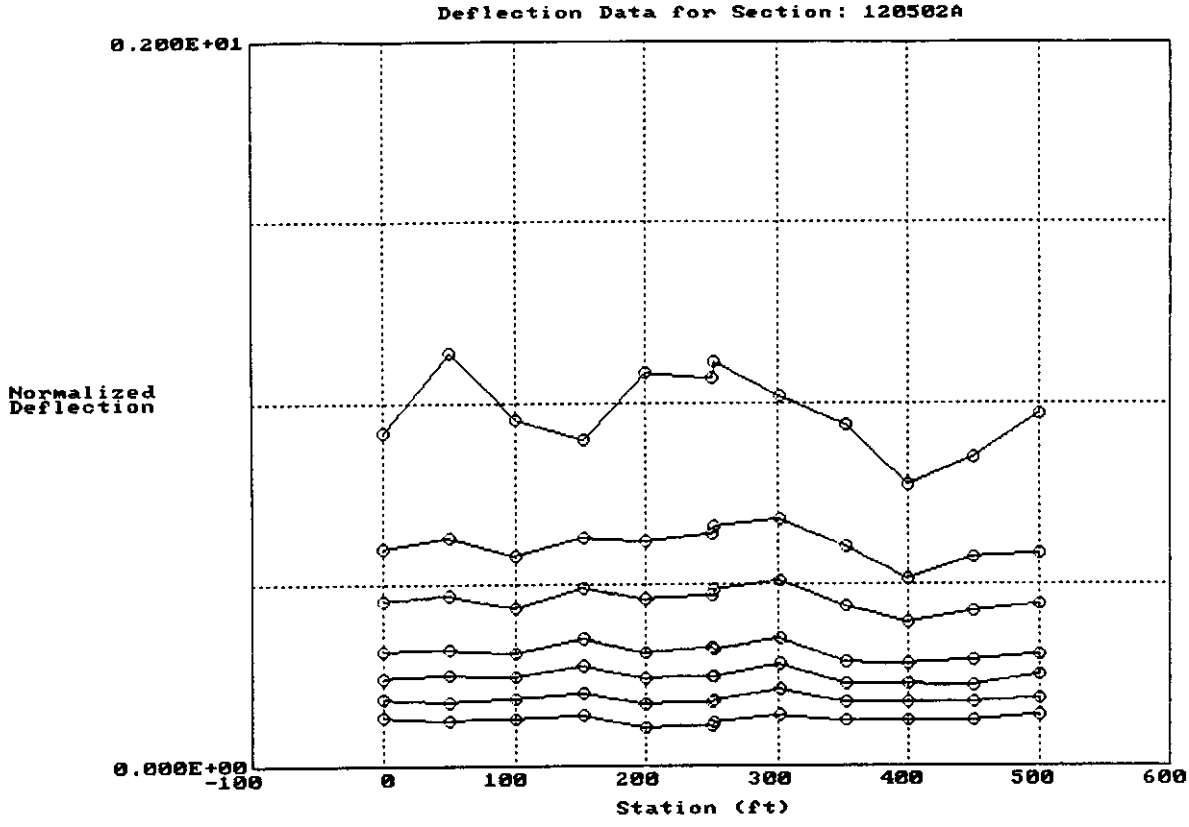
cc: James R. Widmann, Dickerson Florida, Inc.
Bill Miley, Department of Transportation
Mark Sargent, Brent Rauhut Engineering, Inc.
Mulder Brown, Department of Transportation
Edward Yue, Department of Transportation
Christopher J. Kafer Jr., Lawson Noble and Associates
Don Holloman, Martin County Engineer
Butch West, Department of Transportation
James Byron, Department of Transportation
Jimmee-Lu Kice, Department of Transportation
Mill-it Corporation
Bulk Express, Inc.
Davis Asphalt Transportation, Inc.
Mary Johnson
Russell White
Theresa Wood, Kisinger Campo & Associates
J. M. Campo, Kisinger Campo & Associates
Joseph M. Chao, Kisinger Campo & Associates
Manny Then
Scott Cushing
Ray Prescott, Department of Transportation
James Lynch, Department of Transportation

APPENDIX B

DEFLECTION PLOTS -

PRECONSTRUCTION/POSTCONSTRUCTION

PRECONSTRUCTION



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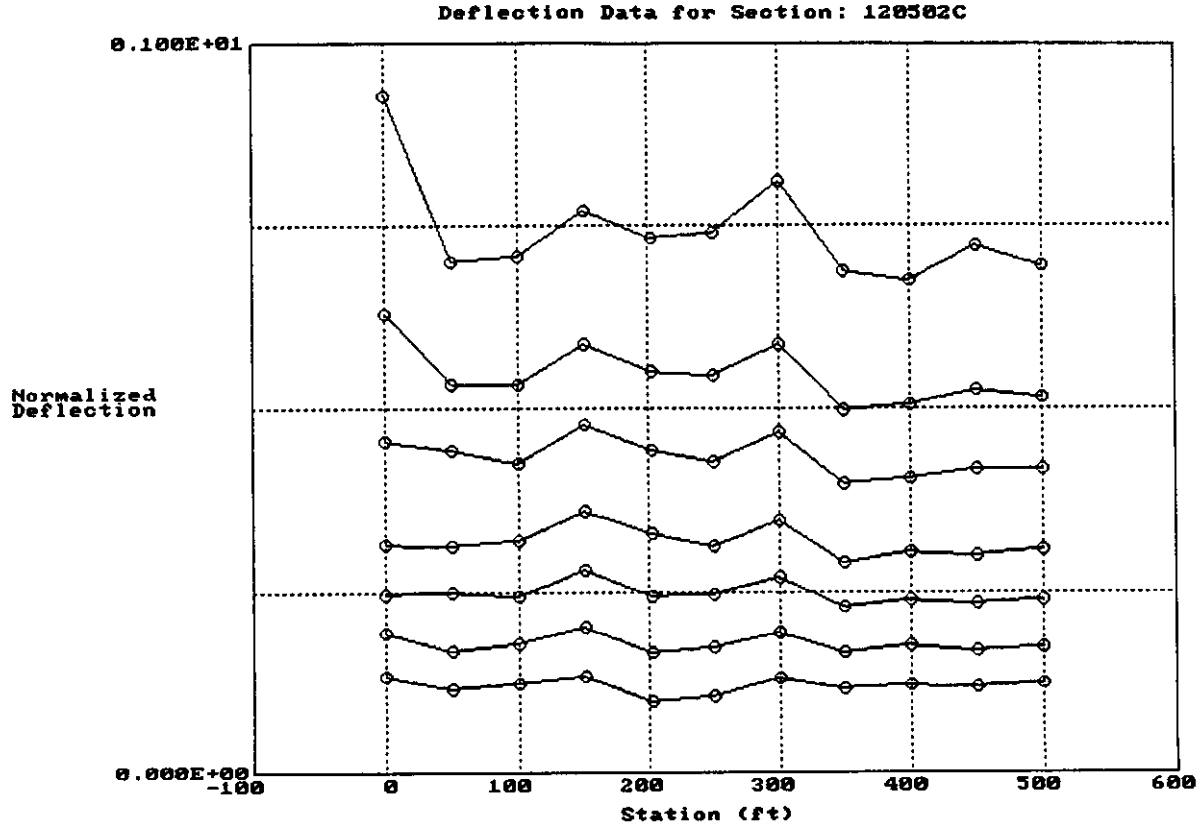

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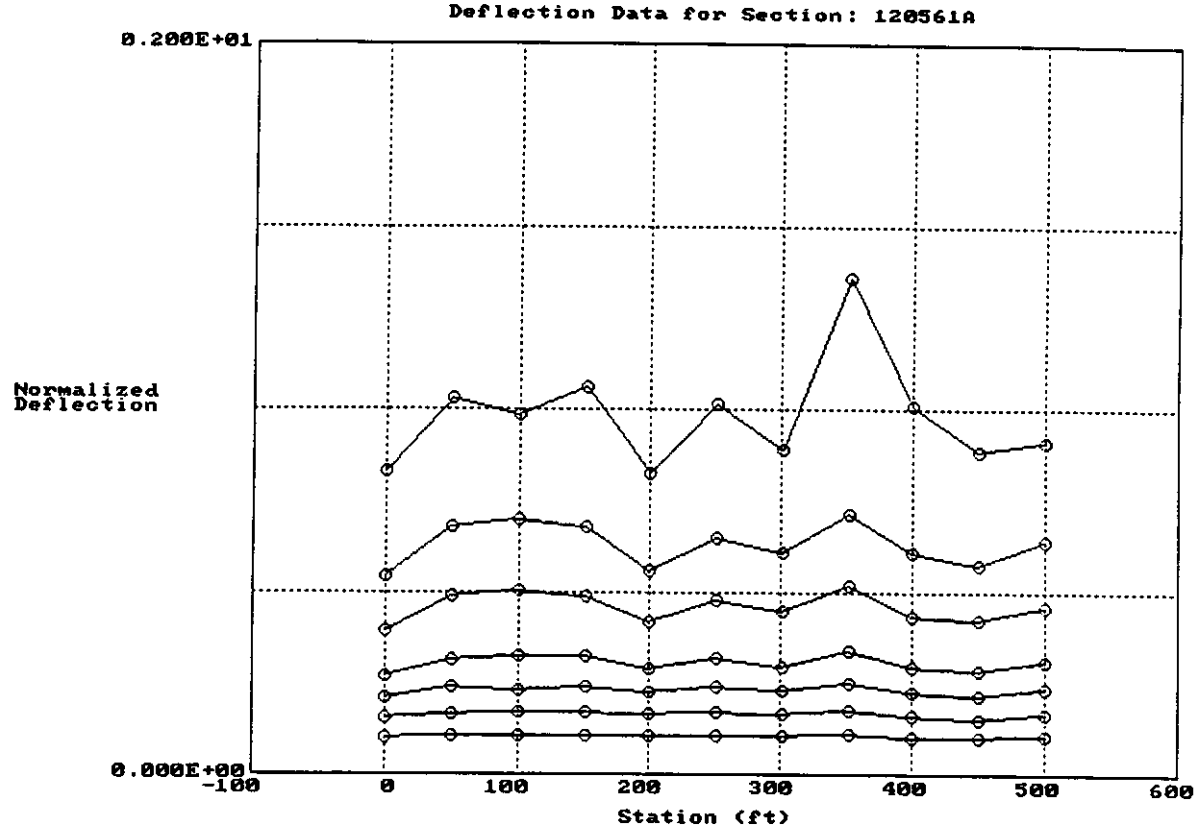

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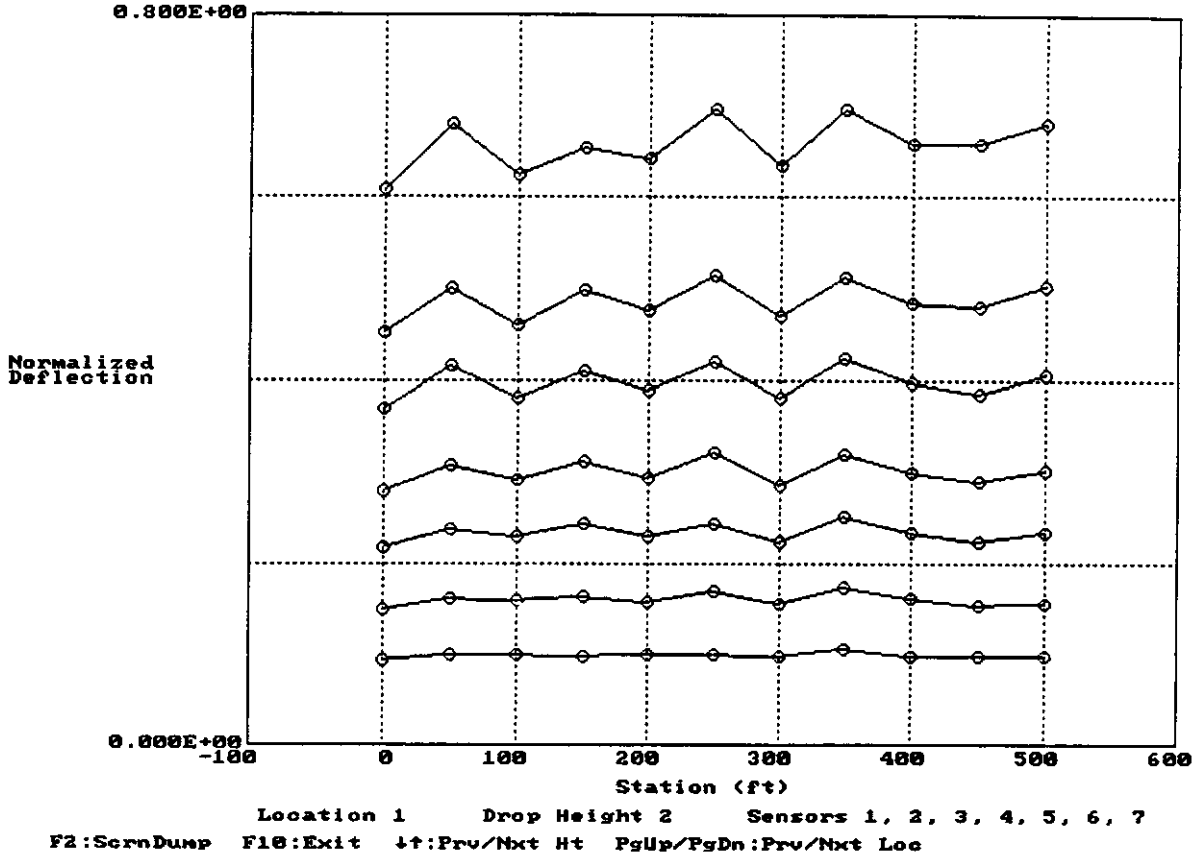

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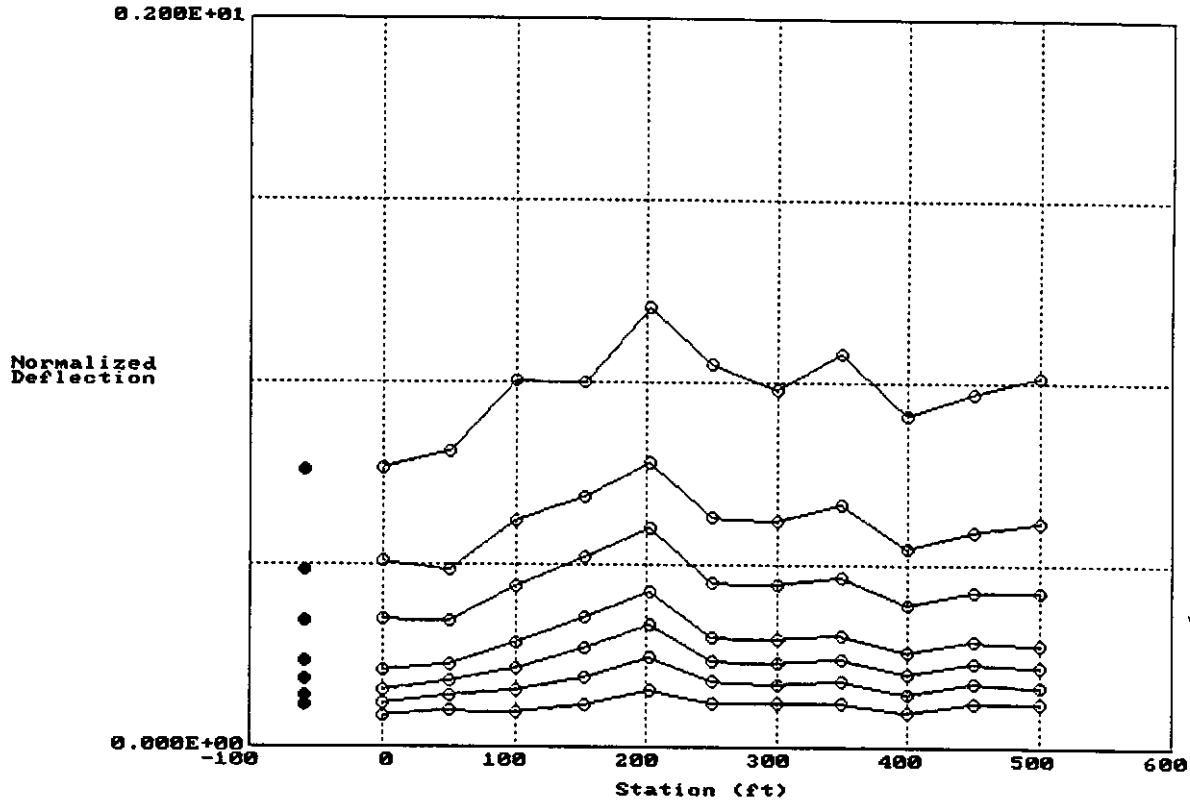

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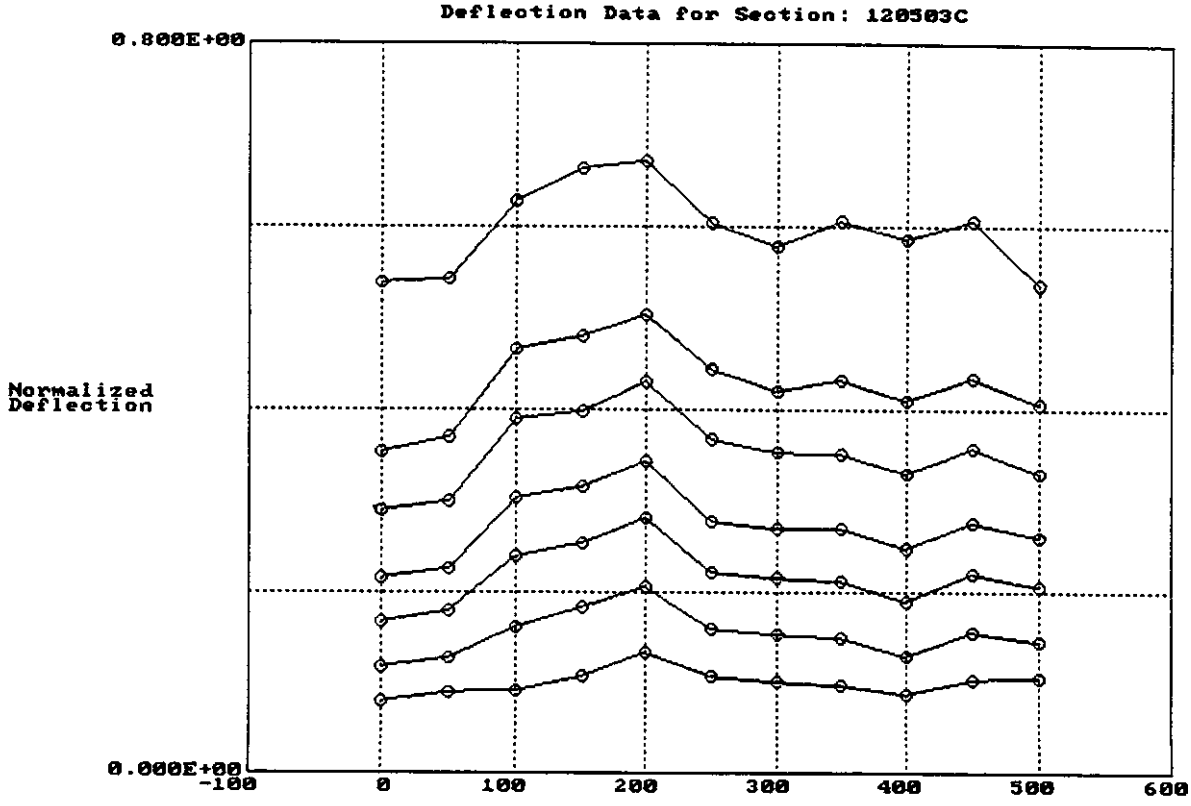

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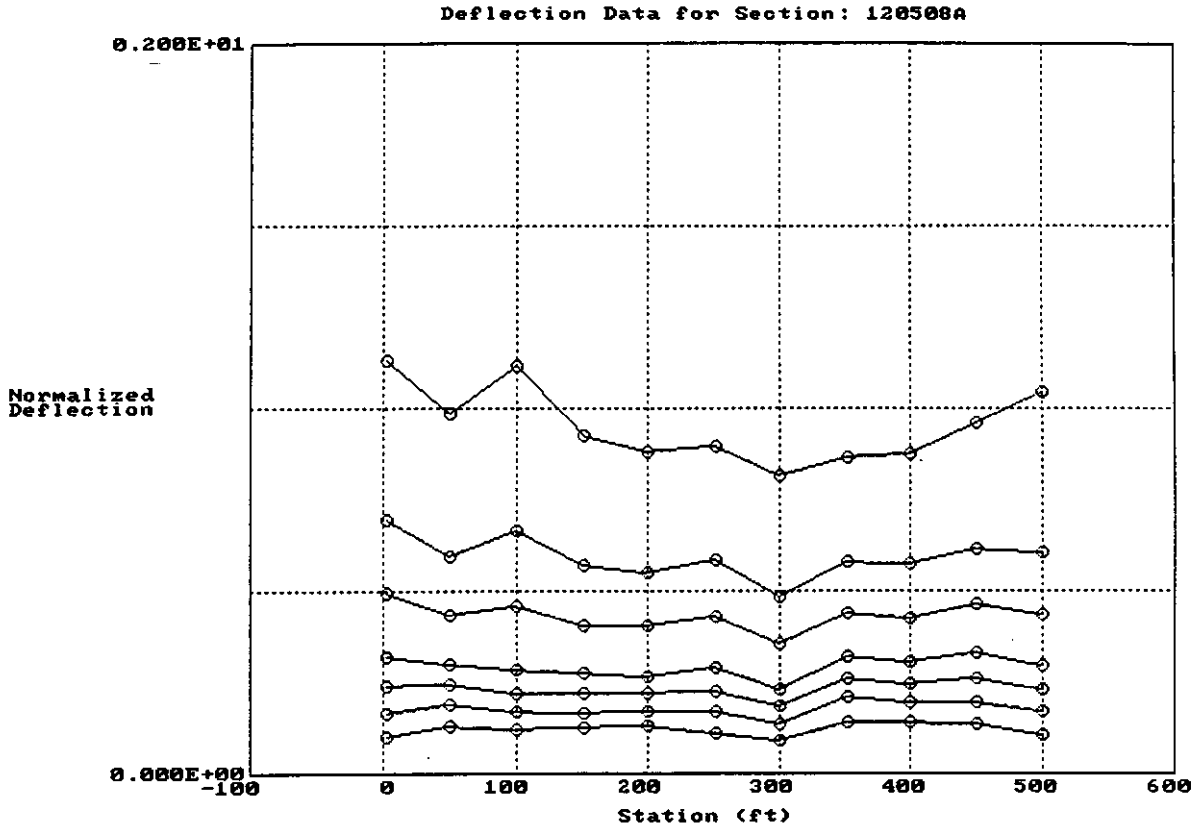

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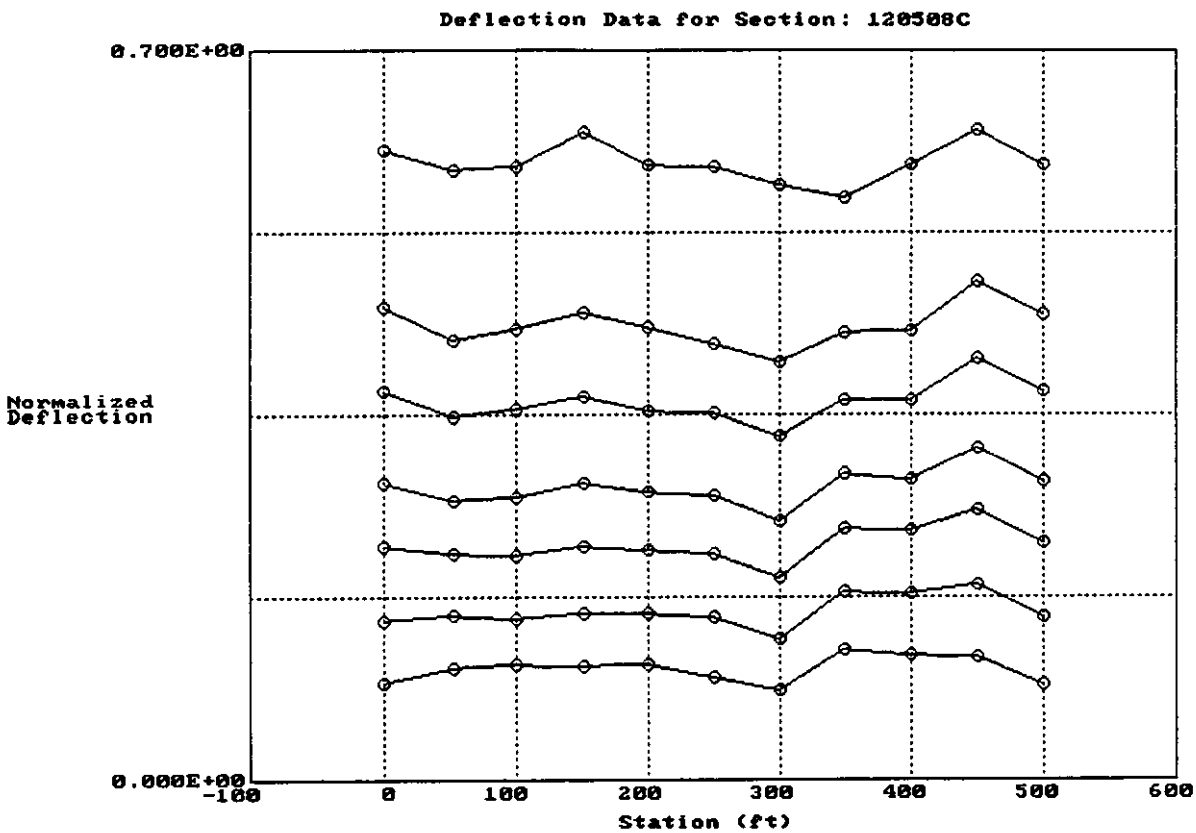

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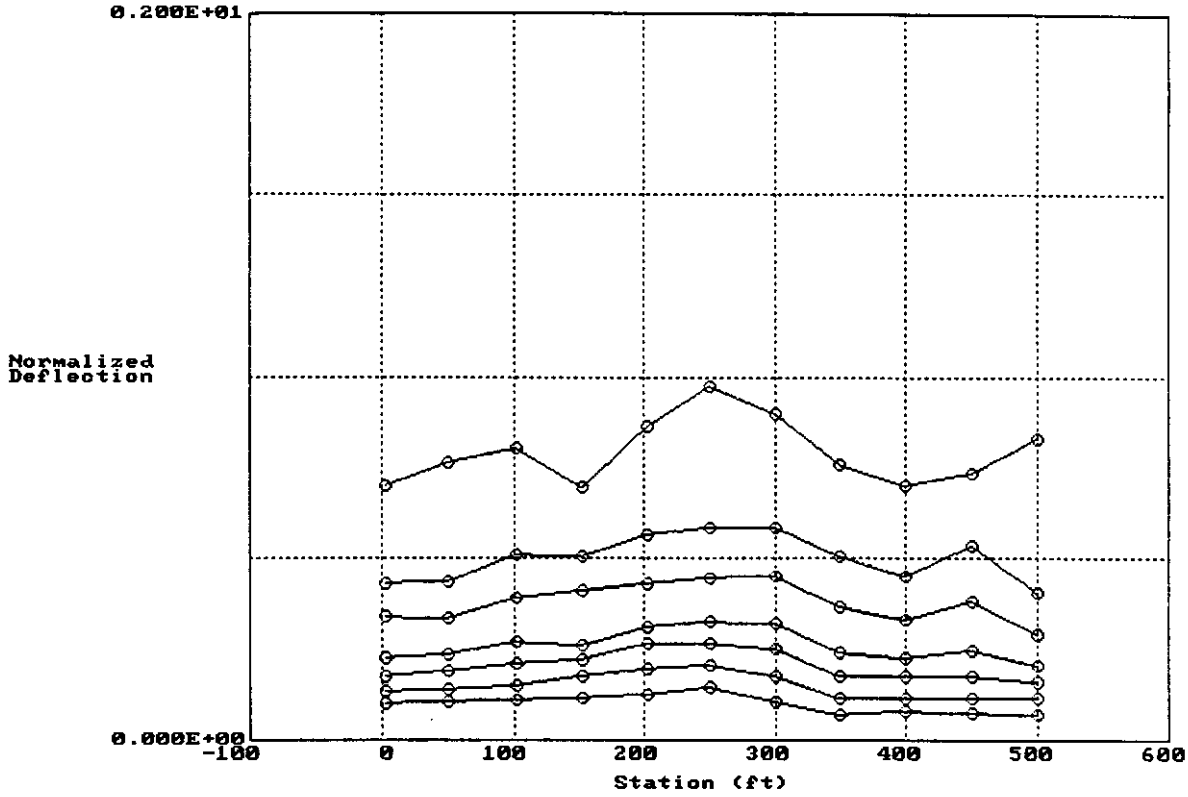

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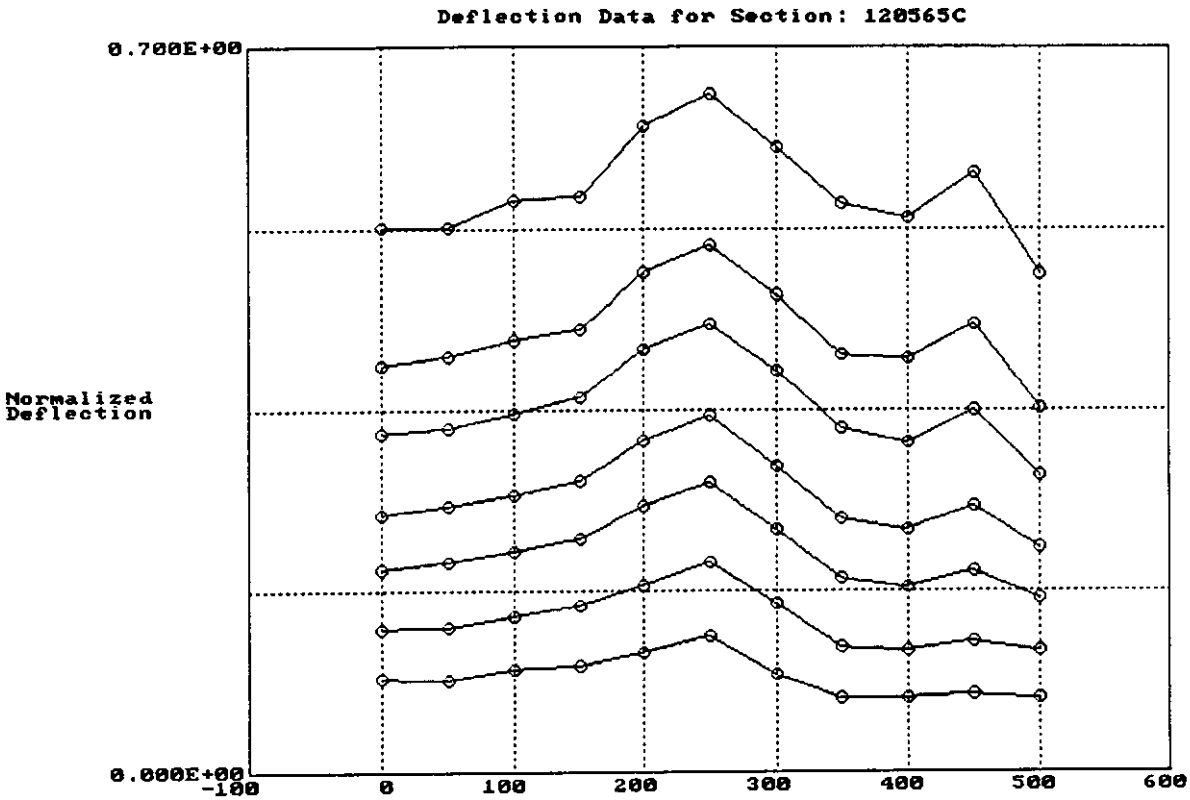

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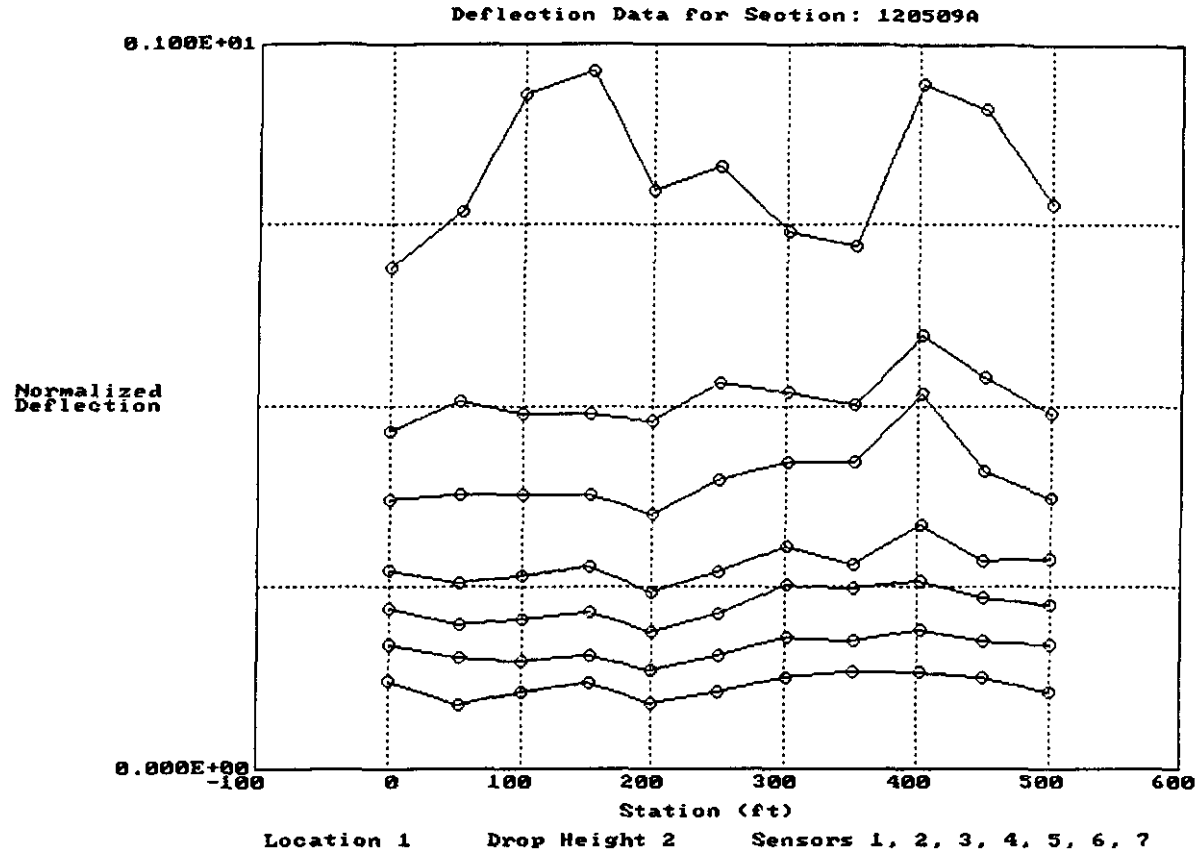

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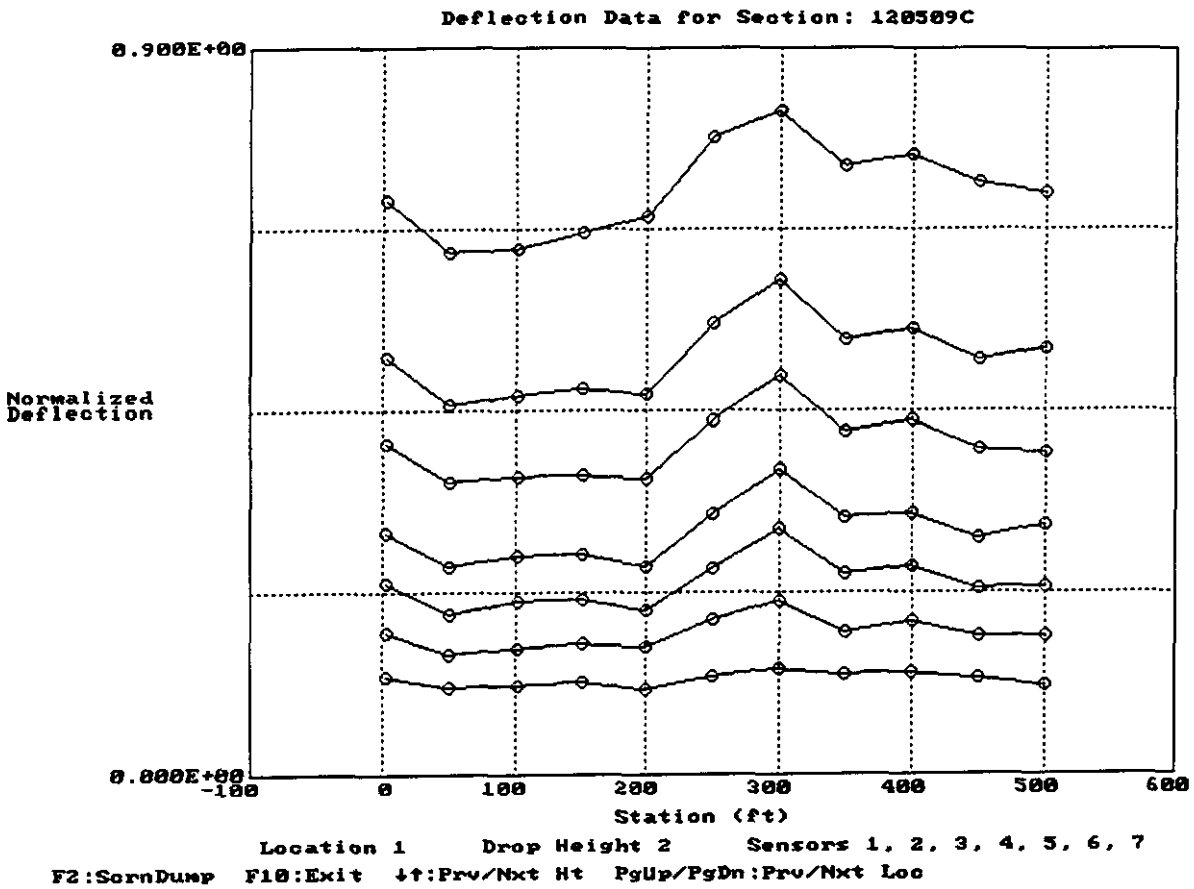

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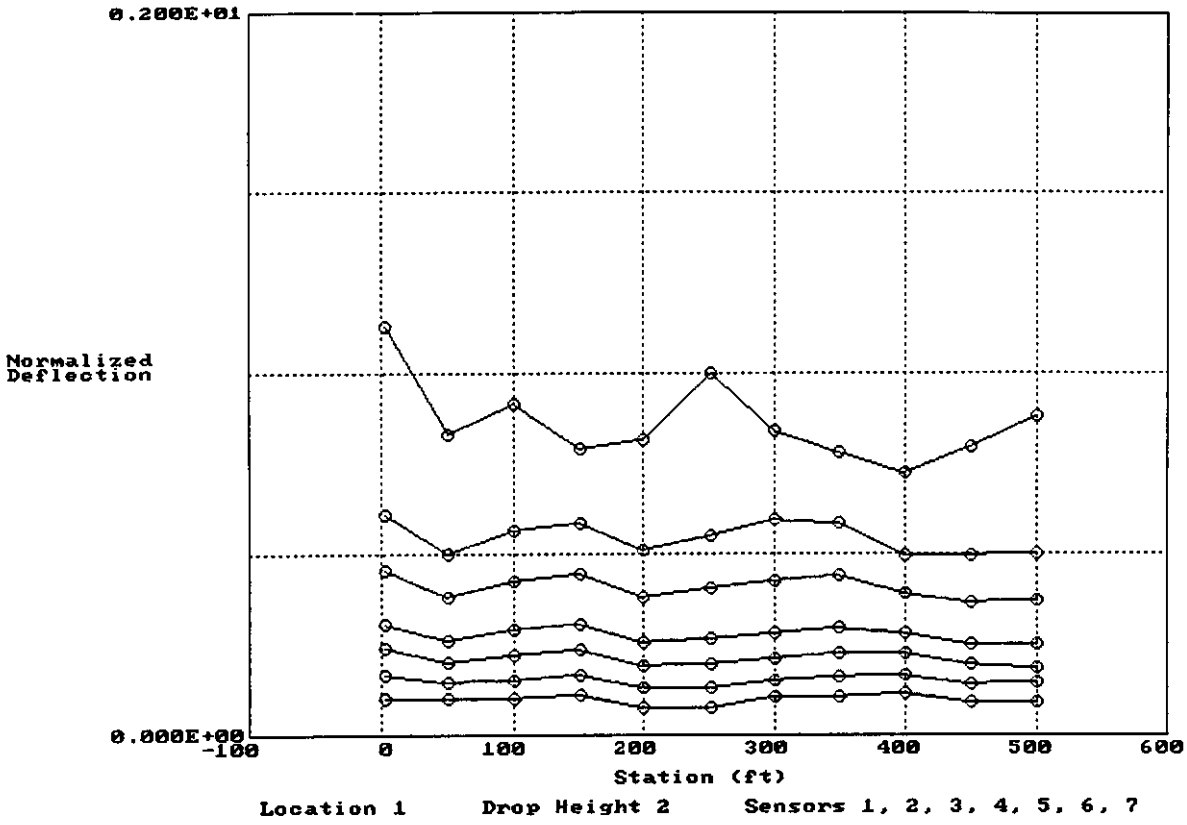

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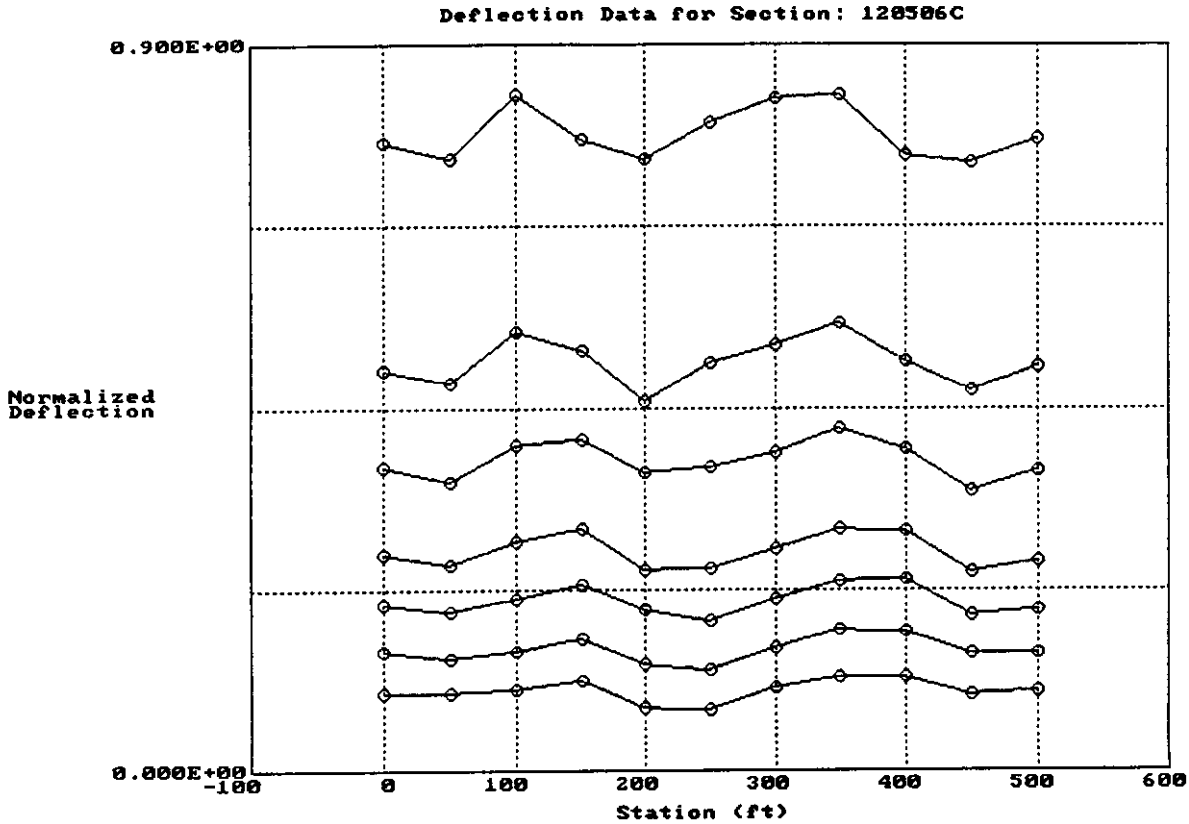

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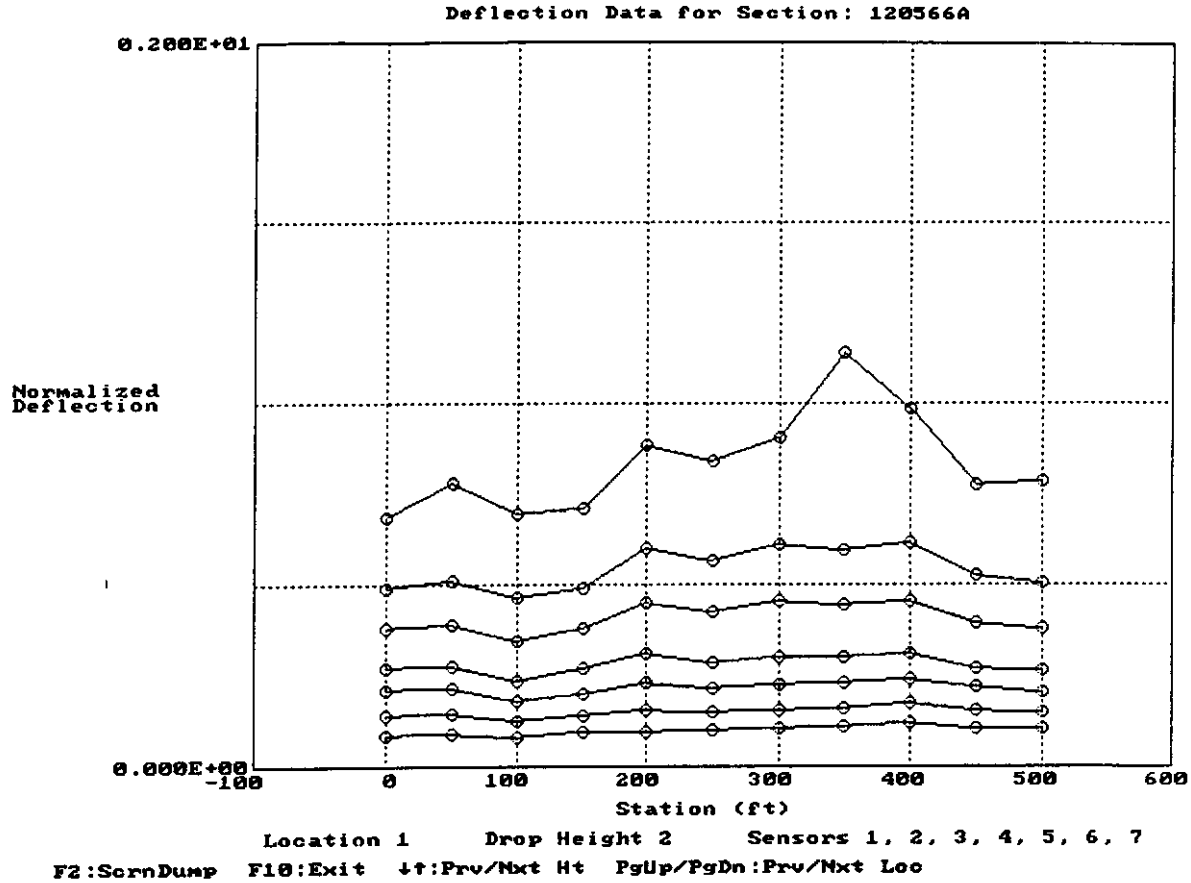

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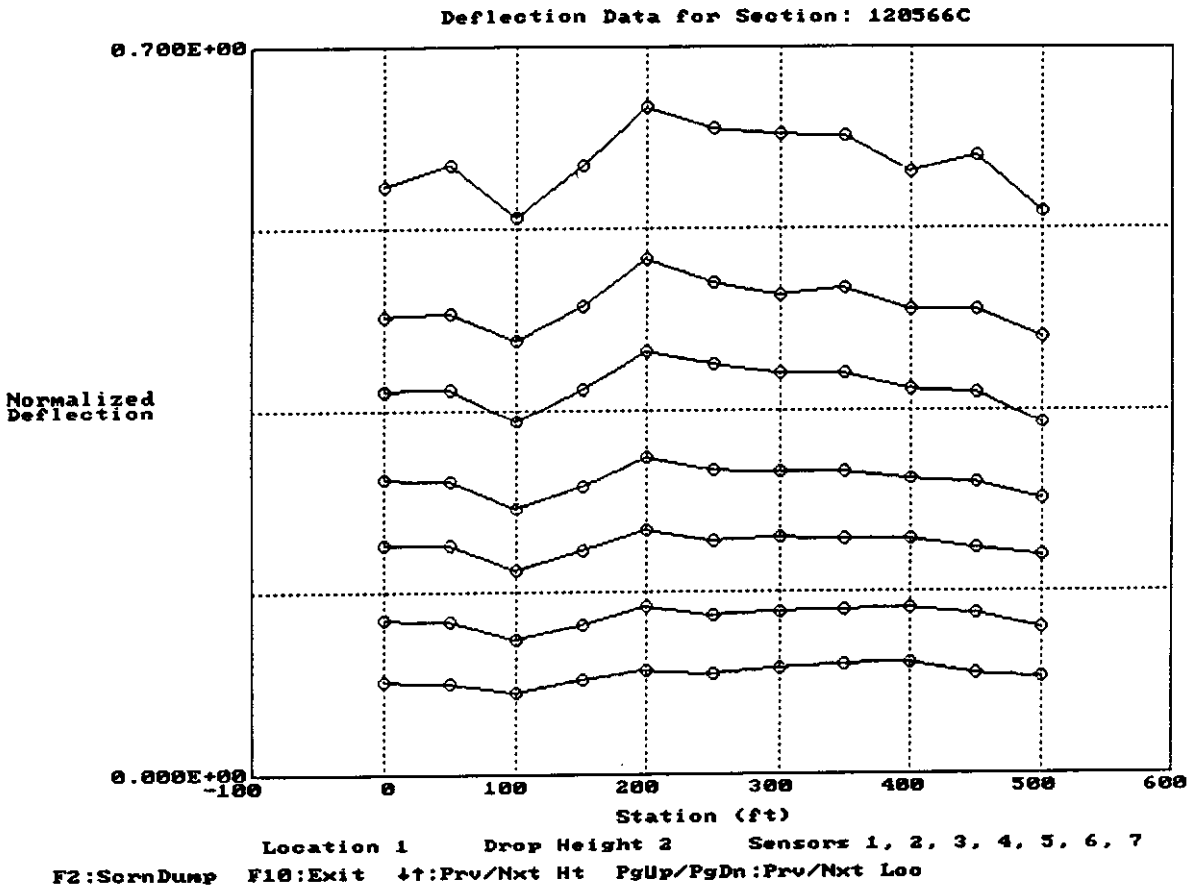

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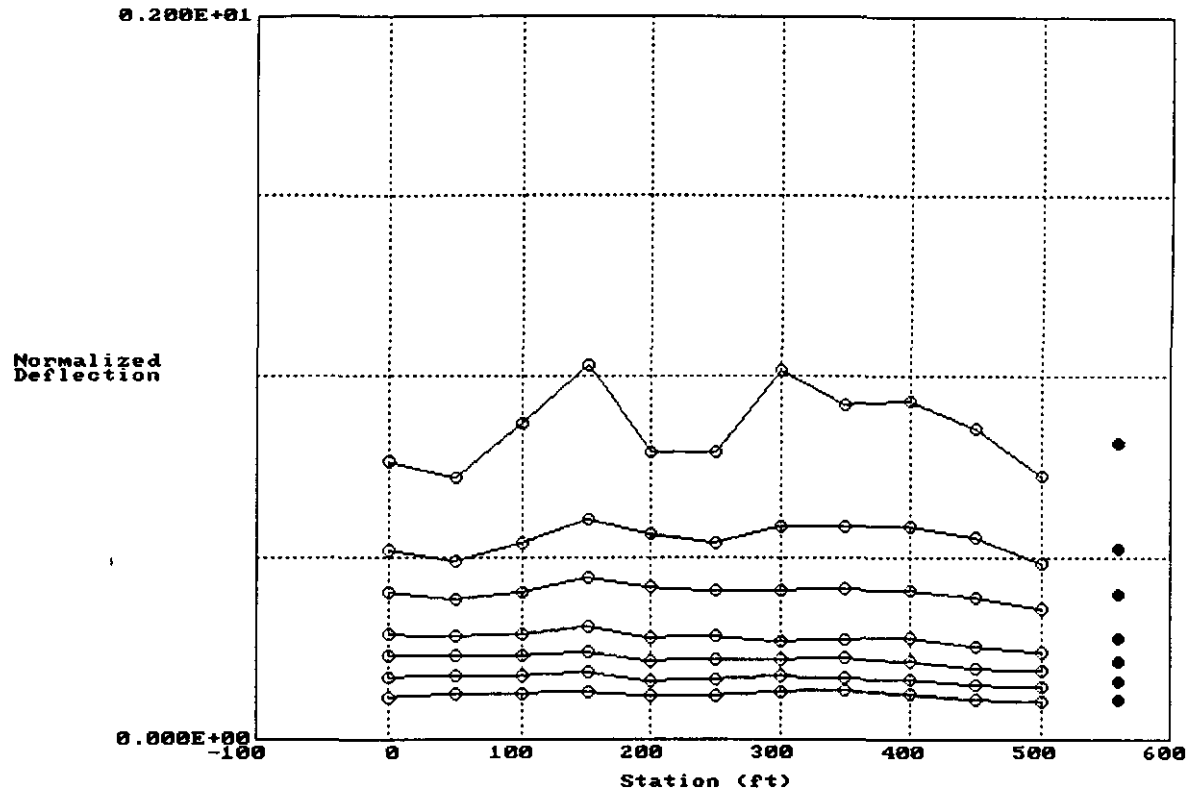

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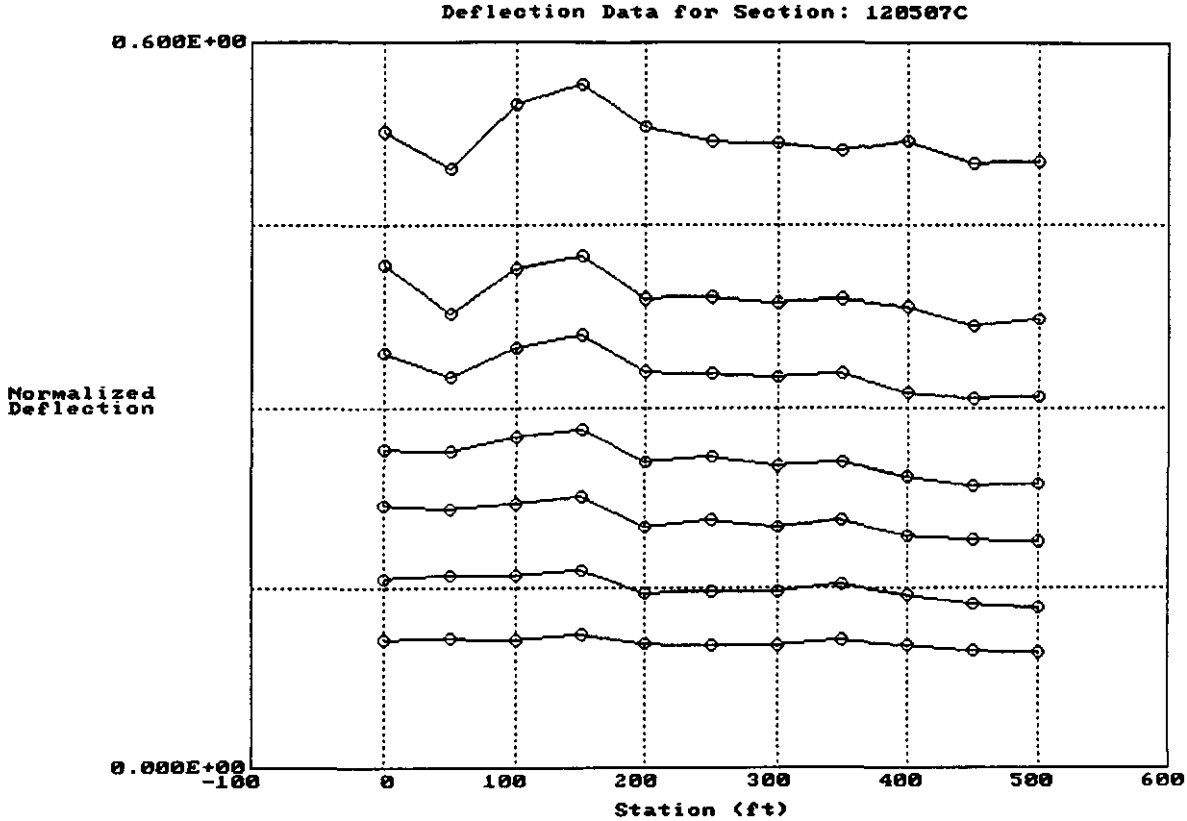

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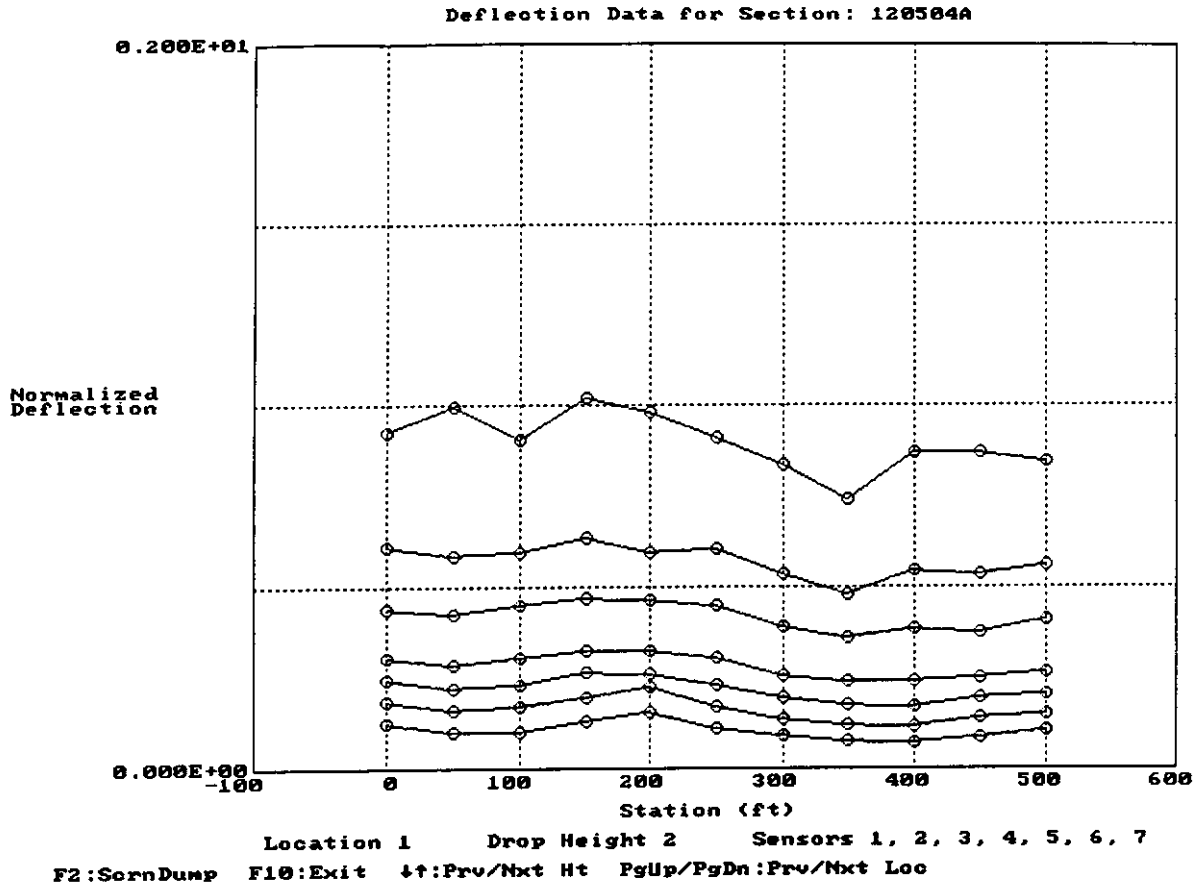
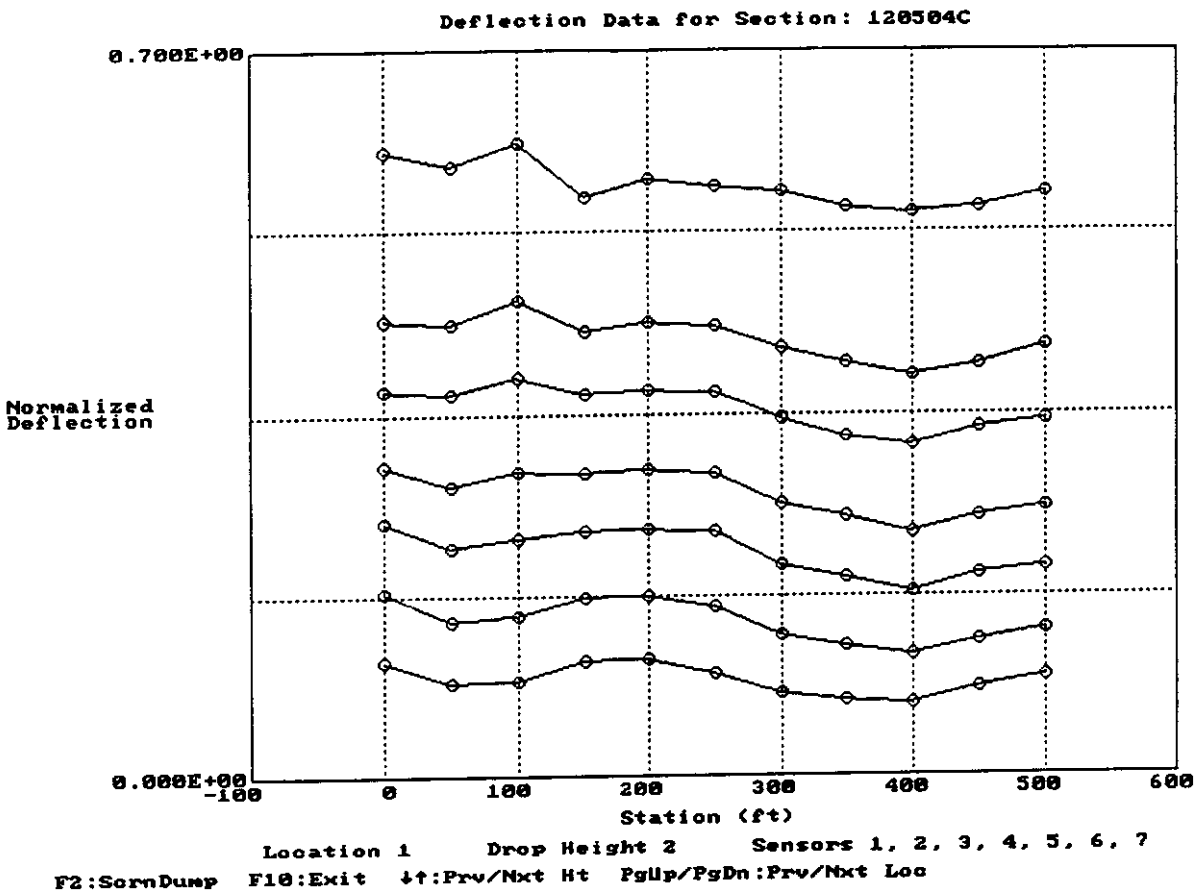
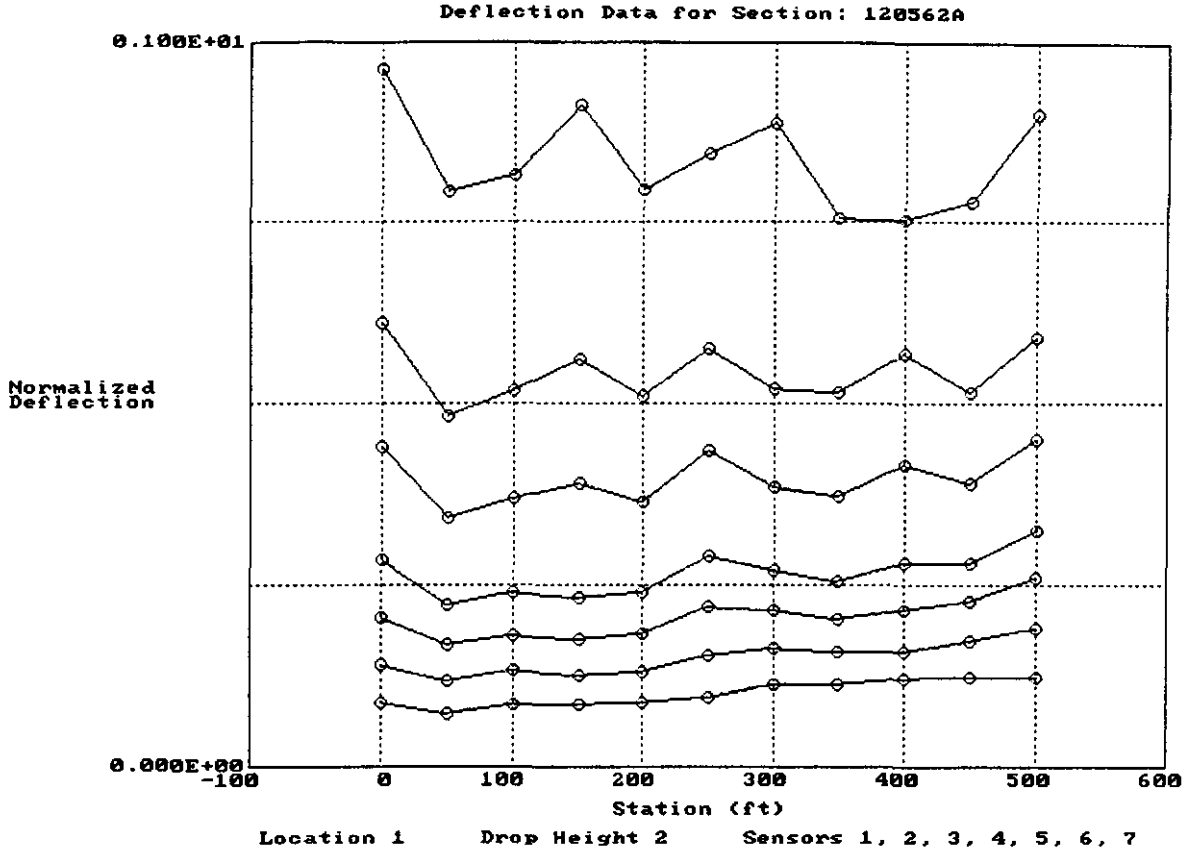


POSTCONSTRUCTION



PRECONSTRUCTION



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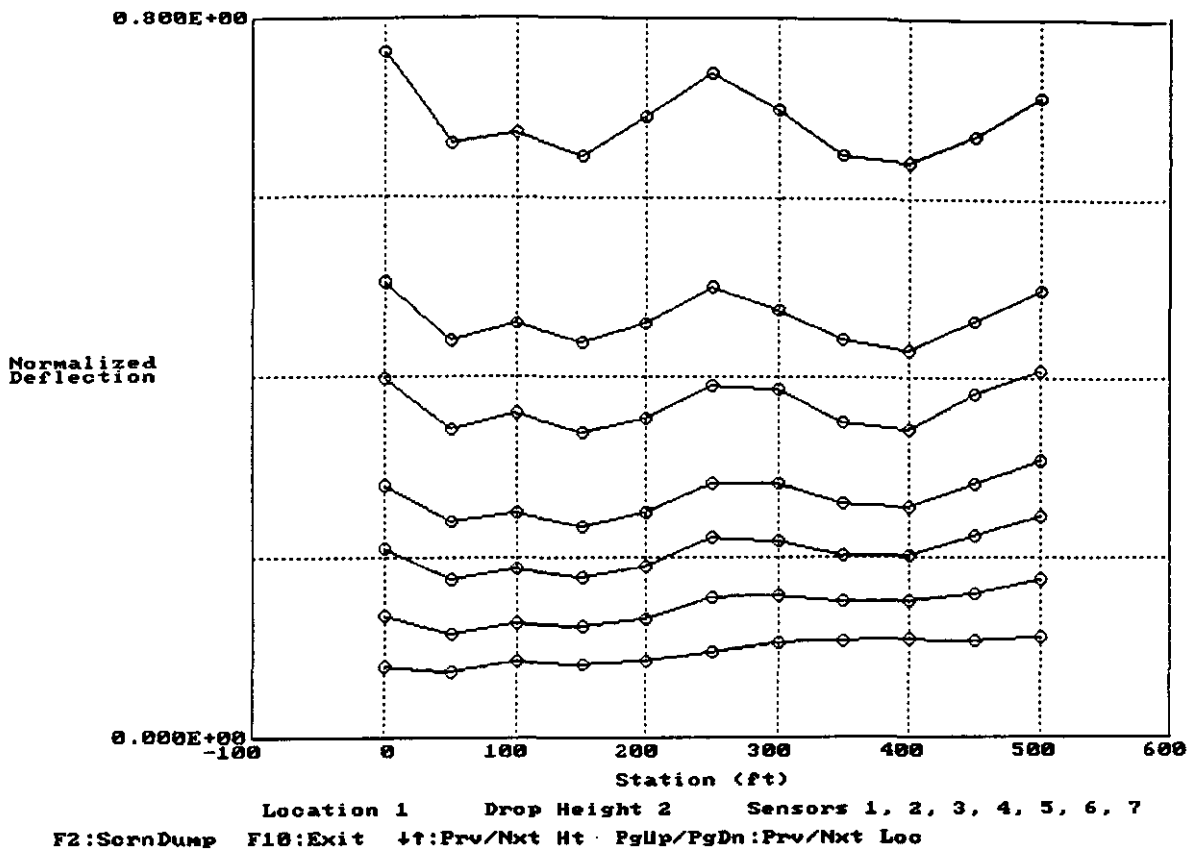
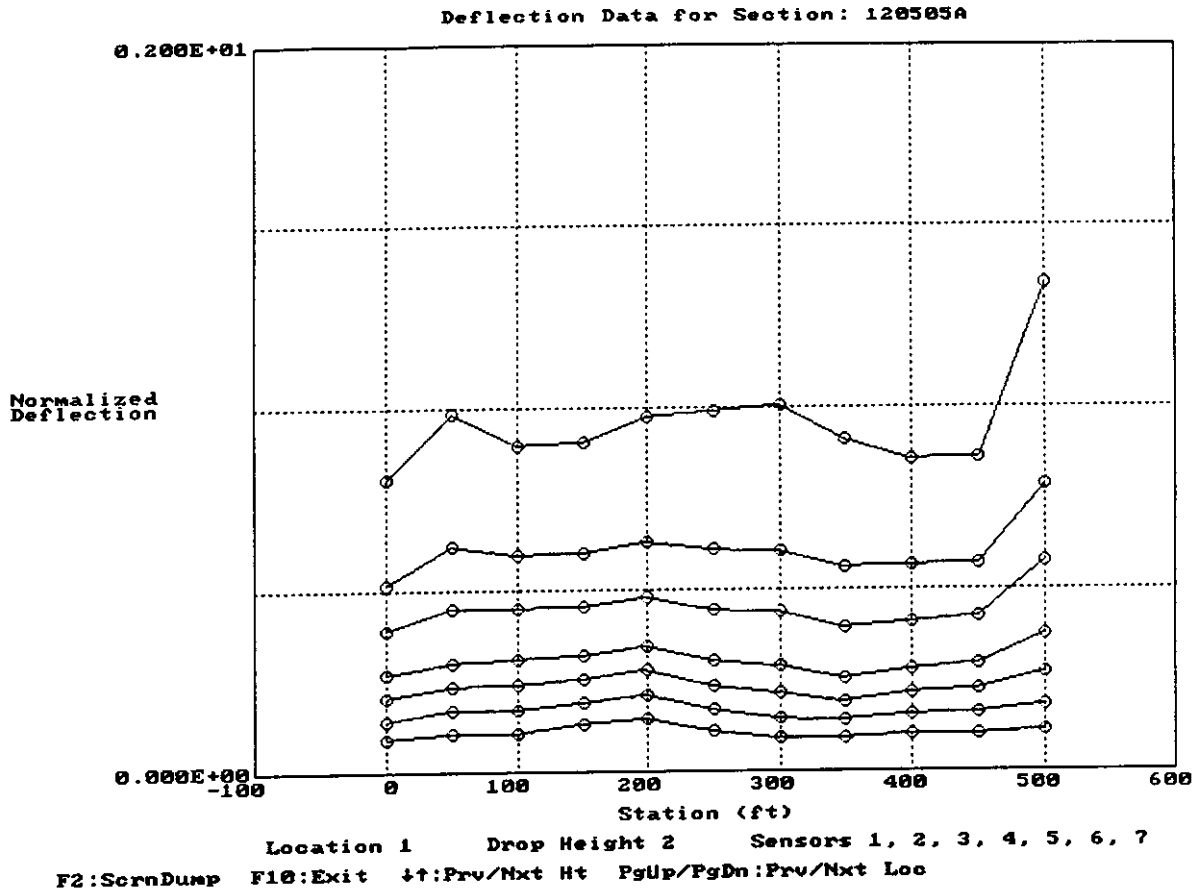


PRECONSTRUCTION



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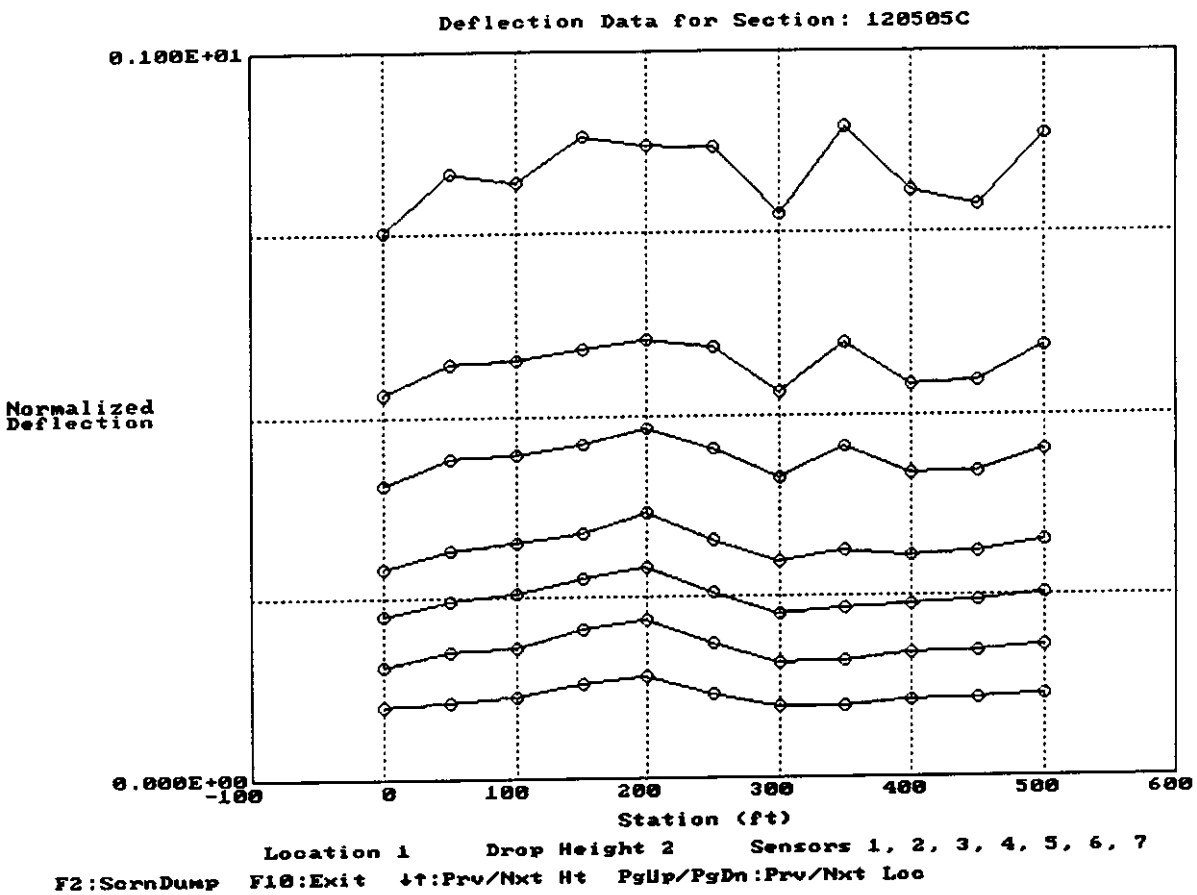
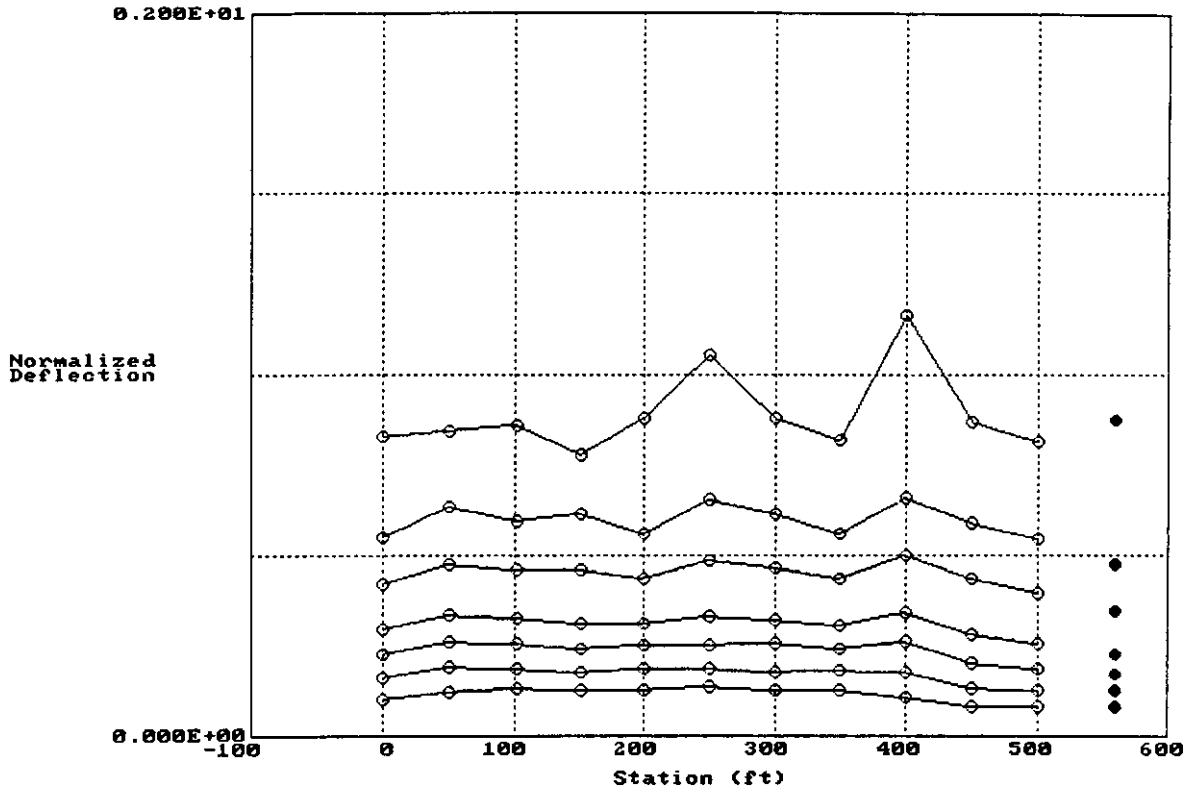
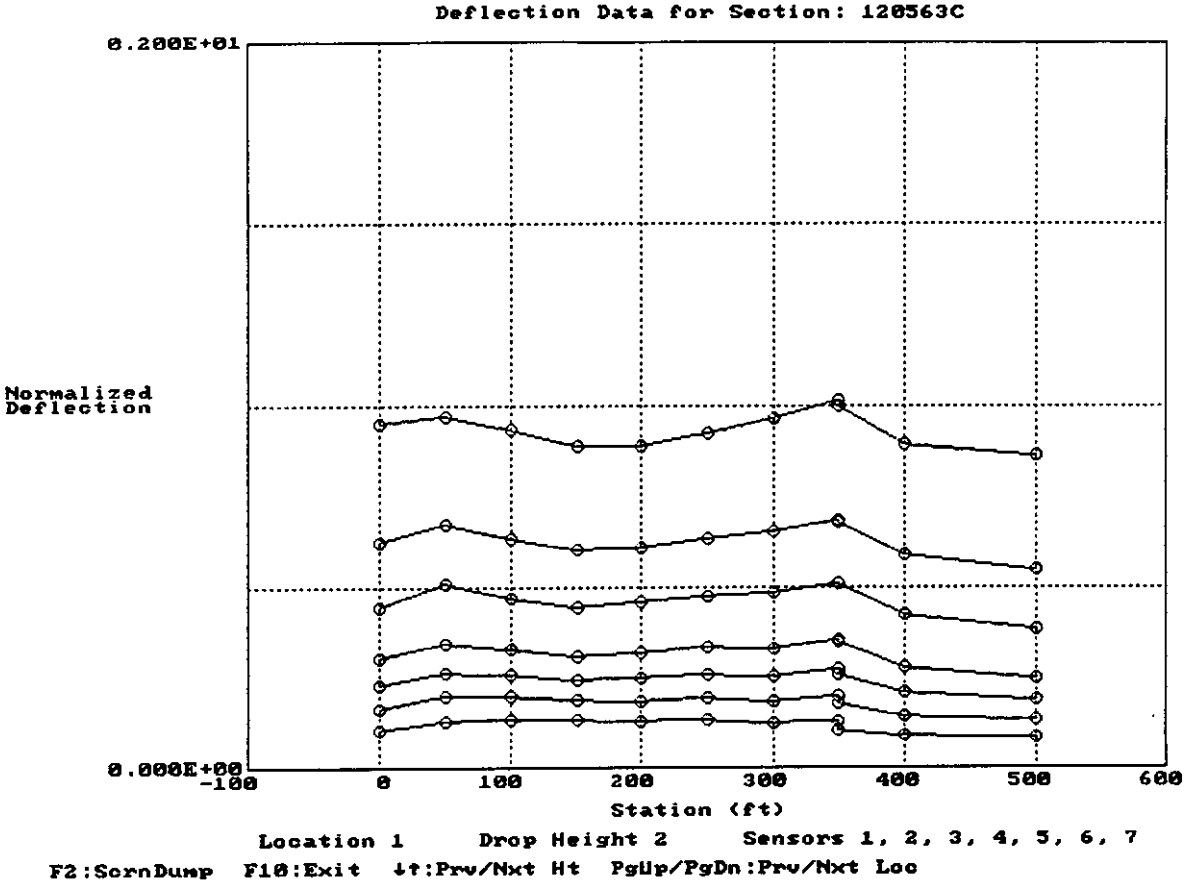


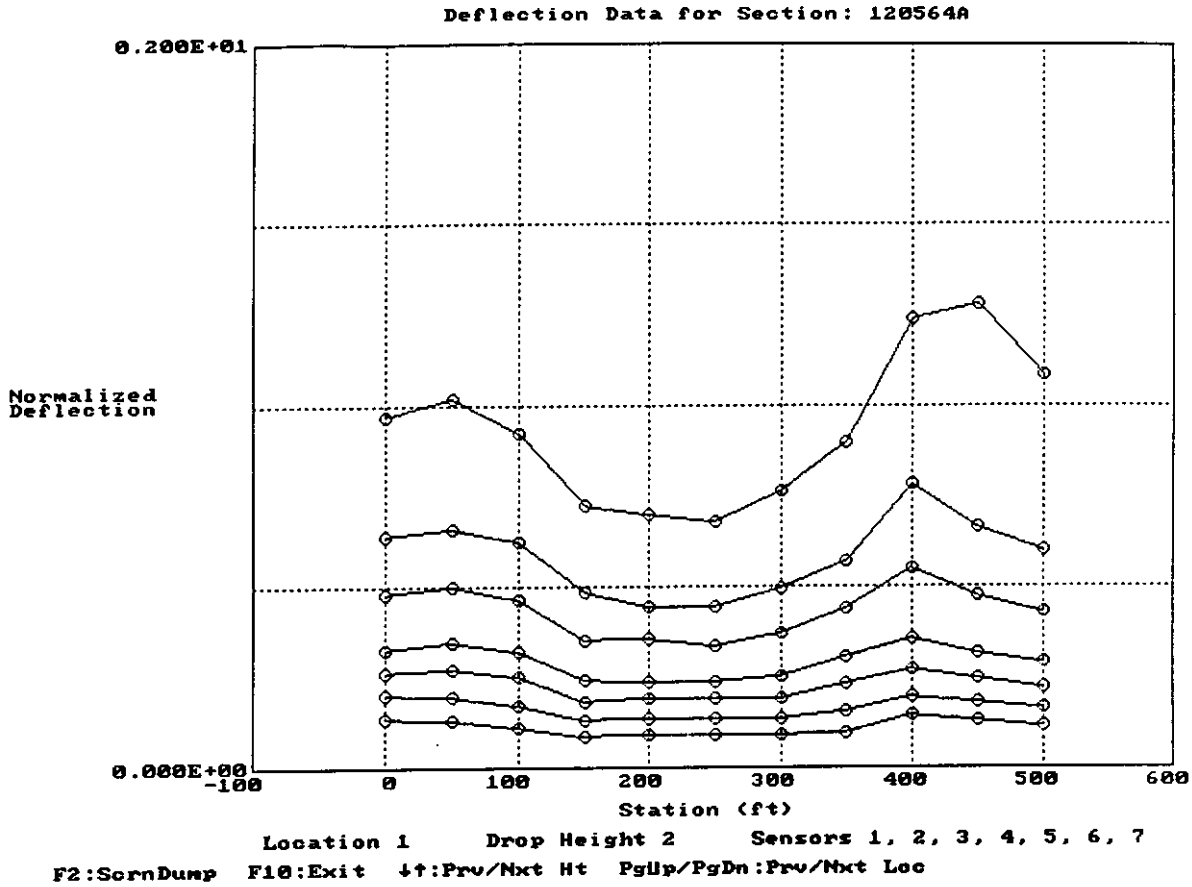
PRECONSTRUCTION



POSTCONSTRUCTION



PRECONSTRUCTION



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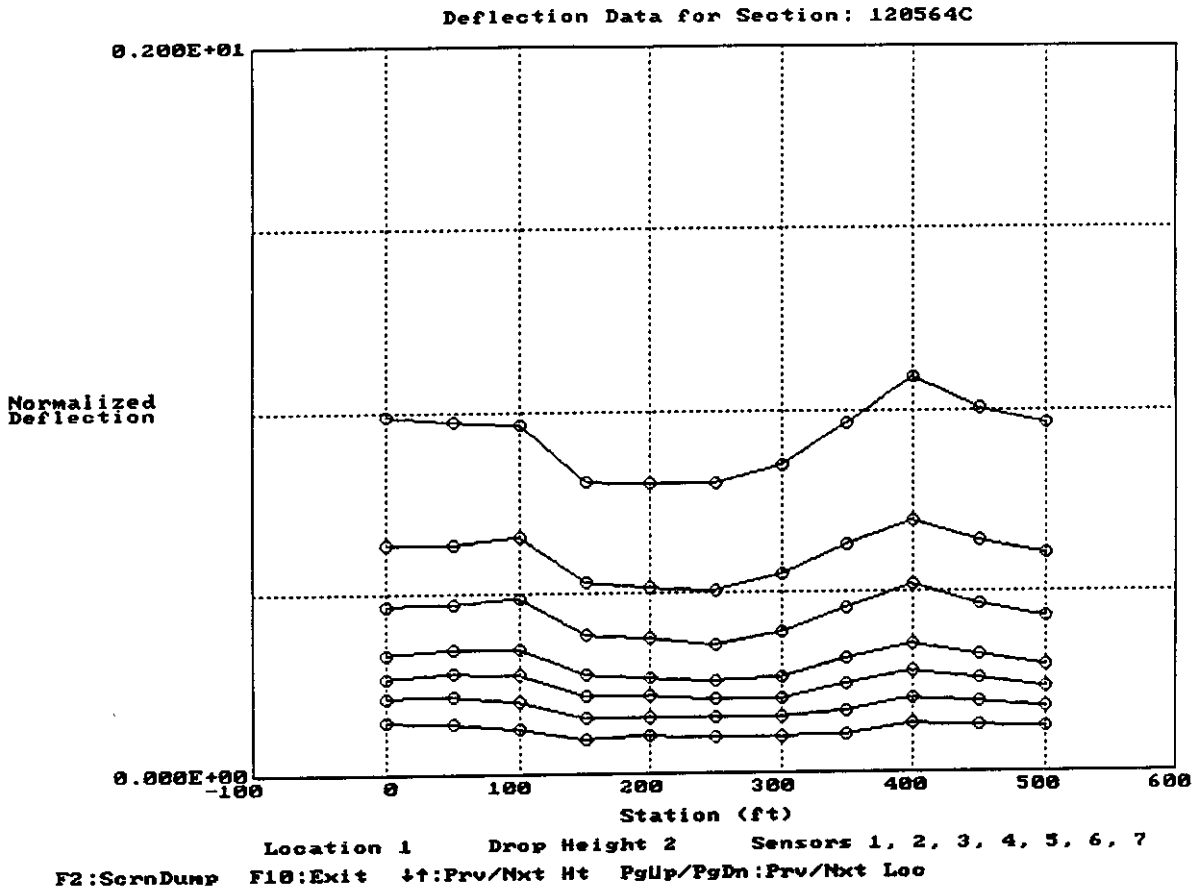


APPENDIX C

MATERIAL SAMPLING AND FIELD TESTING PLAN

MATERIAL SAMPLING
AND
TESTING PLAN

FLORIDA SPS-5 PROJECT 120500
US-1 SBL, MARTIN COUNTY, FLORIDA

PREPARED BY:

BRENT RAUHUT ENGINEERING INC.
LTPP SOUTHERN REGION COORDINATION OFFICE
8240 MOPAC, SUITE 220
AUSTIN, TEXAS 78759

REVISED NOVEMBER 1994

FLORIDA SPS-5 PROJECT 120500

MATERIAL SAMPLING AND TESTING PLAN

REVISED NOVEMBER 1994

TABLE OF CONTENTS

TABLE 1. TEST SECTION LAYOUT
SPS-5, REHABILITATION OF ASPHALT CONCRETE PAVEMENTS
US-1, SBL, MARTIN COUNTY, FLORIDA

SHRP ID	TREATMENT TYPE	SHRP TEST SECTION		TRANSITION	
		Begin Station	End Station	Begin	End
120502	2" Overlay (30% RAP)	339+ 59	333 + 59	333 + 59	317 + 64
U.S. COAST GUARD STATION ENTRANCE Sta. 331 + 52 to Sta. 320 + 71 (Includes Tapers)					
120561	3.5" Overlay (30% RAP)	317 + 64	311 + 64	311 + 64	308 + 58
120503	5" Overlay (30% RAP)	308 + 58	302 + 58	302 + 58	300 + 54
120508	Mill/Inlay 5" Overlay (30% RAP)	300 + 54	294 + 54	294 + 54	- - - - -
JONATHAN DICKINSON PARK ENTRANCE (MAINTENANCE) Sta. 292 + 62 to Sta. 281 + 50 (Includes Tapers)					
120565	Mill/Inlay 3.5" Overlay (30% RAP)	280+ 58	274 + 58	274 + 58	271 + 60
120509	Mill/Inlay 2" Overlay (30% RAP)	271 + 60	265 + 60	265 + 60	261 + 52
120506	Mill/Inlay 2" Overlay (Virgin)	261 + 52	255 + 52	255 + 52	253 + 62
120566	Mill/Inlay 3.5" Overlay (Virgin)	253 + 62	247 + 62	247 + 62	244 + 63
120507	Mill/Inlay 5" Overlay (Virgin)	244 + 63	238 + 63	238 + 63	235 + 62
120504	5" Overlay (Virgin)	235 + 62	229 + 62	229 + 62	226 + 63

TABLE 1. TEST SECTION LAYOUT
SPS-5, REHABILITATION OF ASPHALT CONCRETE PAVEMENTS
US-1, SBL, MARTIN COUNTY, FLORIDA
(Continued)

SHRP ID	TREATMENT TYPE	SHRP TEST SECTION		TRANSITION	
		Begin Station	End Station	Begin	End
120562	3.5" Overlay (Virgin)	226 + 63	220 + 63	220 + 63	217 + 64
120505	2" Overlay (Virgin)	217 + 64	211 + 64	211 + 64	- - - - -
JONATHAN DICKINSON PARK ENTRANCE Sta. 209 + 00 to 205 + 41 (Includes Tapers)					
120563	Mill/Inlay (Virgin)	196 + 64	190 + 64	190 + 64	187 + 65
120564	Mill/Inlay (RAP)	187 + 65	181 + 65	181 + 65	176 + 23
121030	Routine Maintenance (Control & GPS)	176 + 23	163 + 71	- - - - -	- - - - -

TABLE 2. SCOPE OF MATERIAL SAMPLING AND TESTING

MATERIAL & SAMPLING DESCRIPTION	NUMBER OF MATERIAL SAMPLES	SAMPLE TYPE DESIGNATION
PRE-CONSTRUCTION SAMPLING		
1. Asphalt Concrete (Original Layer)		
Coring - 4" diam. cores	40	C1-C40
Coring - 6" diam. cores	4	A1-A4
Bulk Sampling (12"x12" Slab)	2	TP1, TP2, TP3
2. Unbound Base/Subbase Layers (Per Layer)		
Augering 6" diam. holes	4	A1-A4
Bulk Sampling in Test Pits	1	TP1, TP2, TP3
Moisture Content Samples	6	TP1, TP2, TP3
3. Subgrade		
Thin-walled Tube Sampling *(Two tube samples per hole. If undisturbed tube sampling is not possible, splitspoon sampling will be conducted.)	8*	A1-A4
Bulk Sampling in Test Pits	1	TP1, TP2, TP3
Moisture Content Samples	6	TP1, TP2, TP3
4. Shoulder Auger Probes	5	S1-S5
POST-CONSTRUCTION SAMPLING		
1. Asphaltic Concrete (Overlay)		
Coring - 4" diam. cores	64	C41-C104

TABLE 3. SPS-5 LABORATORY TESTING PLANS (PRECONSTRUCTION)

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	40	All C-Type Cores
Bulk Specific Gravity	AC02	P02	12	[C2 C3 C4], (C17 C18 C19), (C23 C24), [C32] (C35 C36)
Maximum Specific Gravity	AC03	P03	3	[TP1], [TP2], [TP3]
Asphalt Content (Extraction)	AC04	P04	3	[TP1], [TP2], [TP3]
Creep Compliance	AC06	P06	3	(C1 C9 C20) (Note 1)
Resilient Modulus	AC07	P07	8	(C6 C7), (C18 C19), (C23 C24), (C35 C36)
Tensile Strength	AC07	P07	12	(C5 C6 C7), (C17 C18 C19), (C22 23 C24), (C34 C35 C36)
Field Moisture Damage	AC08	P08	4	[A1, A2, A3, A4]
B. EXTRACTED AGGREGATE:				
Type and Classification:				
Coarse Aggregate	AG03	P13	4	[TP1], [TP2], [TP3]
Fine Aggregate	AG03	P13	4	[TP1], [TP2], [TP3]
Gradation of Aggregate	AG04	P14	4	[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.

( ) This designation indicates that the FHWA will perform tests for the indicated samples.

[ ] This designation indicates that the State will perform tests for the indicated samples.

TABLE 3. SPS-5 LABORATORY TESTING PLANS (PRECONSTRUCTION) (Continued)

MATERIAL TYPE AND PROPERTIES	SHRP TEST DESIGNATION	SHRP PROTOCOL	NO. OF TESTS PER LAYER	MATERIAL SOURCE/ SAMPLE TYPE DESIGNATION
D. BOUND (TREATED) BASE AND SUBBASE (IF APPLICABLE)				
Type and Classification of Material and Treatment	TB01	P31	4	[C6 C7], (C18 C19), (C23 C24), (C35 C36)
Pozzolanic/Cementitious: Compression Strength	TB02	P32	4	[C6 C7], (C18 C19), (C23 C24), (C35 C36)
Asphalt Treated: Dynamic Modulus (77F)	TB03	P33	4	[C6 C7], (C18 C19), (C23 C24), (C35 C36)
HMAC: Resilient Modulus	ACO7	P07	4	[C6 C7], (C18 C19), (C23 C24), (C35 C36)
E. 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)
F. SUBGRADE				
Sieve Analysis	SS01	P51	3	(TP1), (TP2), (TP3)
Hydrometer to 0.001 mm.	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 A2 A3 A4), or (TP1), (TP2), (TP3)
Unit Weight	SS08	P56	3	(TP1), (TP2), (TP3)
Natural Moisture Content	SS09	P49	3	(TP1), (TP2), (TP3)
Depth to Rigid Layer			5	S1, S2, S3, S4, S5

NOTES: ( ) This designation indicates that the FHWA will perform tests for the indicated samples.
[ ] This designation indicates that the State will perform tests for the indicated samples.

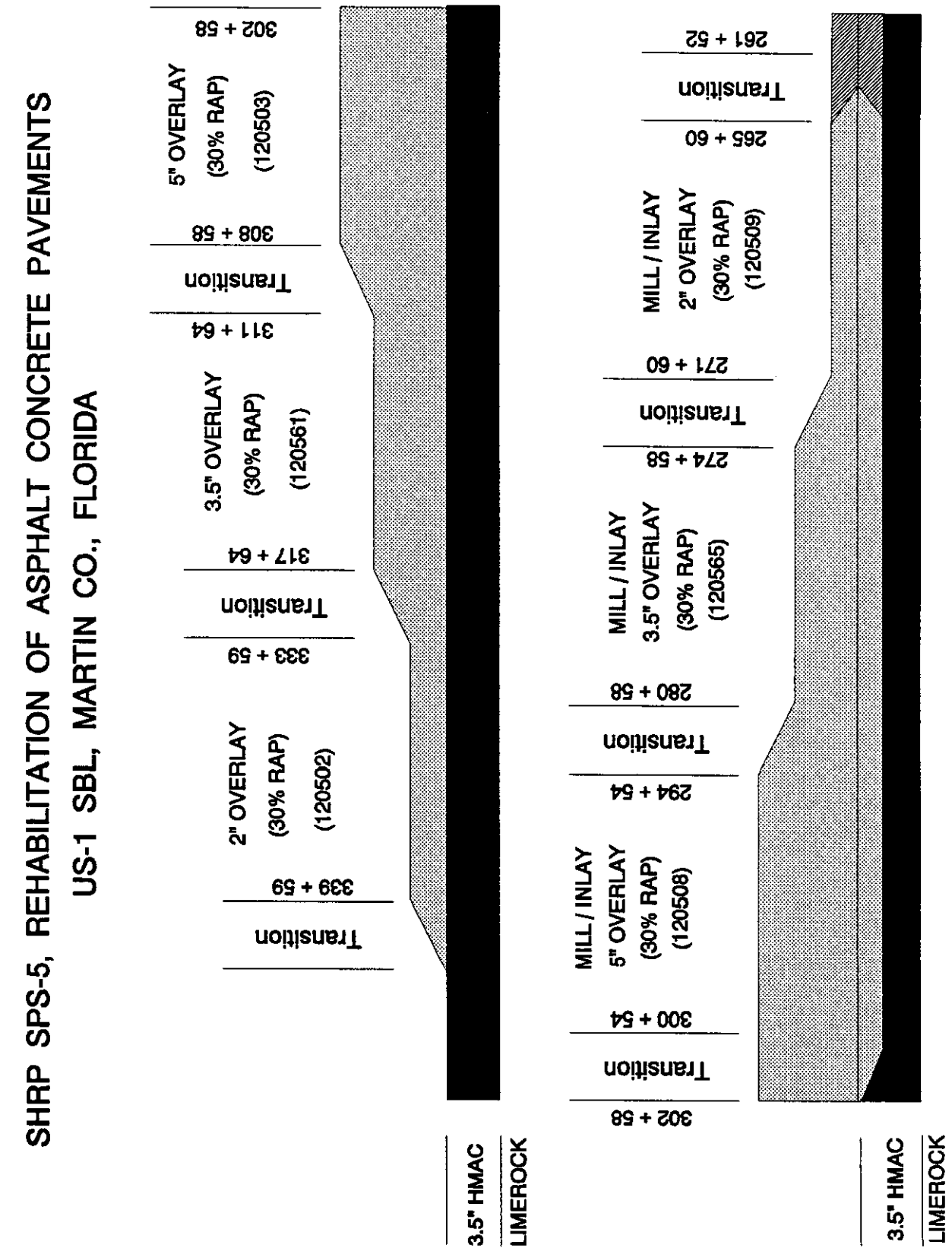
TABLE 4. SPS-5 LABORATORY TESTING PLANS (POSTCONSTRUCTION)

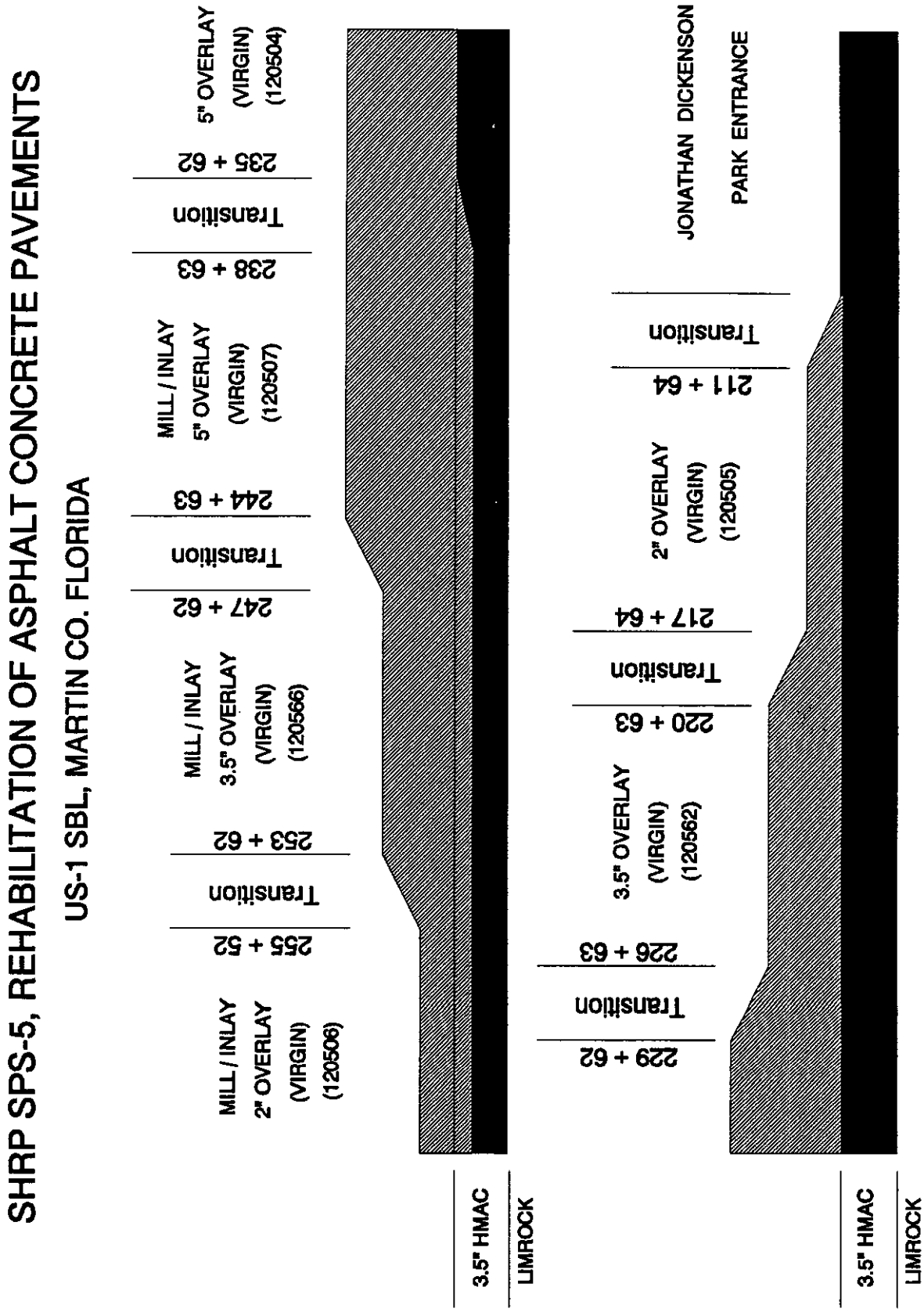
MATERIAL TYPE AND PROPERTIES	SHRP TEST DESIGNATION	SHRP PROTOCOL	NO. OF TESTS PER LAYER	MATERIAL SOURCE/ SAMPLE TYPE DESIGNATION
A. ASPHALTIC CONCRETE:				
Core Examination/Thickness	AC01	P01	61	All Cores (All Cores)
Bulk Specific Gravity	AC02	P02	61	All Cores (All Cores)
Maximum Specific Gravity	AC03	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	4	(C55 C56 C57), (C77 C78 C79) (Note 1)
Resilient Modulus	AC07	P07	6	(C50 C51), (C53 C54), (C59 C60), (C81 C82), (C84 C85), (C87 C88)
Tensile Strength	AC07	P07	18	(C49 C50 C51), (C52 C53 C54), (C58 C59 C60), (C80 C81 C82), (C83 C84 C85), (C86 C87 C88)
B. EXTRACTED AGGREGATE:				
Bulk Specific Gravity:				
Coarse Aggregate	AG01	P11	6	[BV1, BV2, BV3, BR1, BR2, BR3]
Fine Aggregate	AG02	P12	6	[BV1, BV2, BV3, BR1, BR2, BR3]
Type and Classification:				
Coarse Aggregate	AG03	P13	6	[BV1, BV2, BV3, BR1, BR2, BR3]
Fine 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.

( ) This designation indicates that the FHWA will perform tests for the indicated samples.

[ ] This designation indicates that the State will perform tests for the indicated samples.


SHRP SPS-5, REHABILITATION OF ASPHALT CONCRETE PAVEMENTS
US-1 SBL, MARTIN CO., FLORIDA
Transition
339 + 59
2" OVERLAY (30% RAP) (120502)
Transition
333 + 59
317 + 64
3.5" OVERLAY (30% RAP) (120561)
Transition
311 + 64
308 + 58
5" OVERLAY (30% RAP) (120503)
302 + 58
3.5" HMAC
LIMEROCK
Transition
294 + 54
MILL / INLAY 5" OVERLAY (30% RAP) (120508)
Transition
280 + 58
274 + 58
MILL / INLAY 3.5" OVERLAY (30% RAP) (120565)
Transition
271 + 60
265 + 60
MILL / INLAY 2" OVERLAY (30% RAP) (120509)
Transition
261 + 52
302 + 58
3.5" HMAC
LIMEROCK


SHRP SPS-5, REHABILITATION OF ASPHALT CONCRETE PAVEMENTS
US-1 SBL, MARTIN CO. FLORIDA
MILL / INLAY
2" OVERLAY
(VIRGIN)
(120506)
255 + 52
Transition
253 + 62
MILL / INLAY
3.5" OVERLAY
(VIRGIN)
(120566)
247 + 62
Transition
244 + 63
MILL / INLAY
5" OVERLAY
(VIRGIN)
(120507)
238 + 63
Transition
235 + 62
5" OVERLAY
(VIRGIN)
(120504)
3.5" HMAC
LIMROCK
229 + 62
Transition
226 + 63
3.5" OVERLAY
(VIRGIN)
(120562)
220 + 63
Transition
217 + 64
2" OVERLAY
(VIRGIN)
(120505)
211 + 64
Transition
JONATHAN DICKENSON
PARK ENTRANCE
3.5" HMAC
LIMROCK

SHRP SPS-5, REHABILITATION OF ASPHALT CONCRETE PAVEMENTS

US-1 SBL, MARTIN CO. FLORIDA

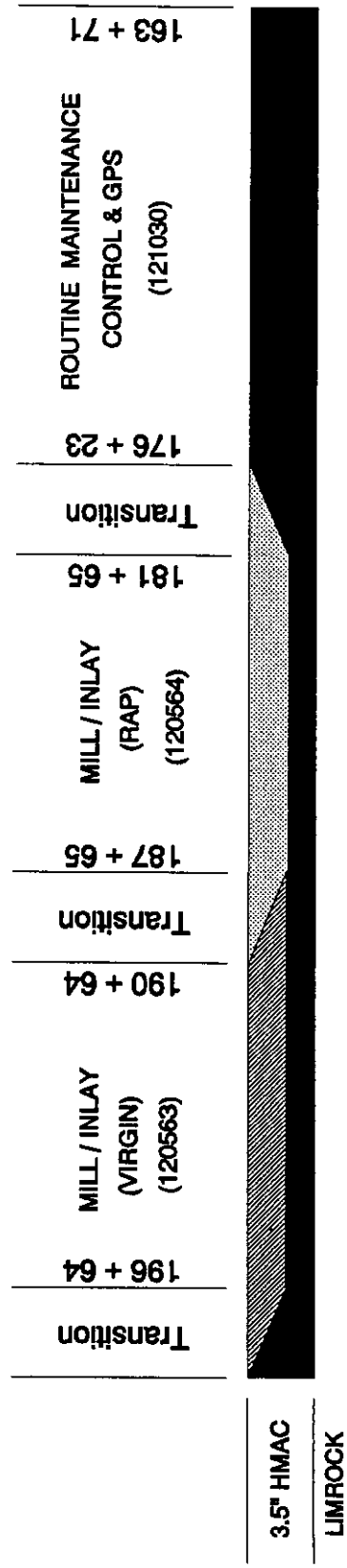
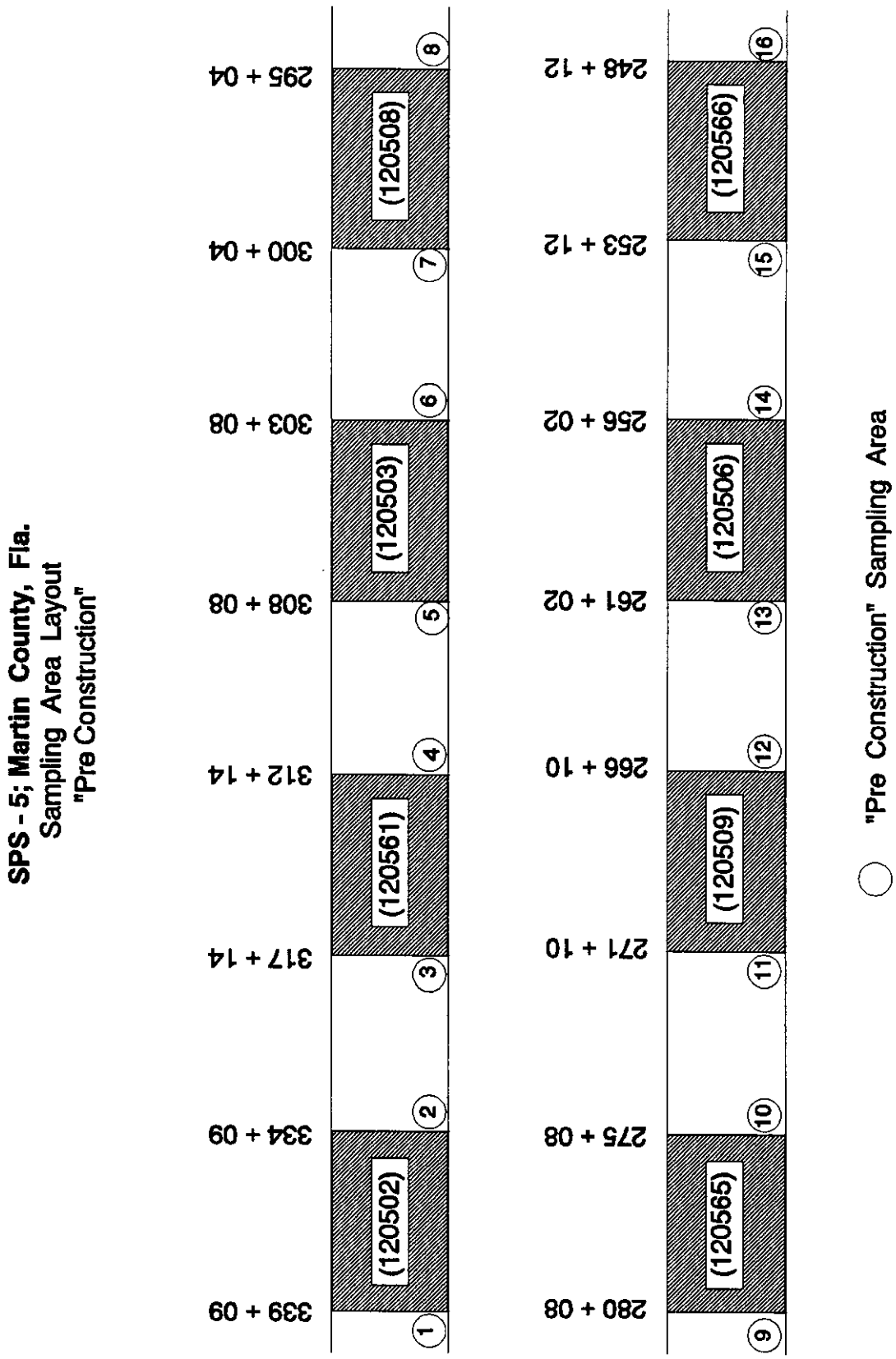
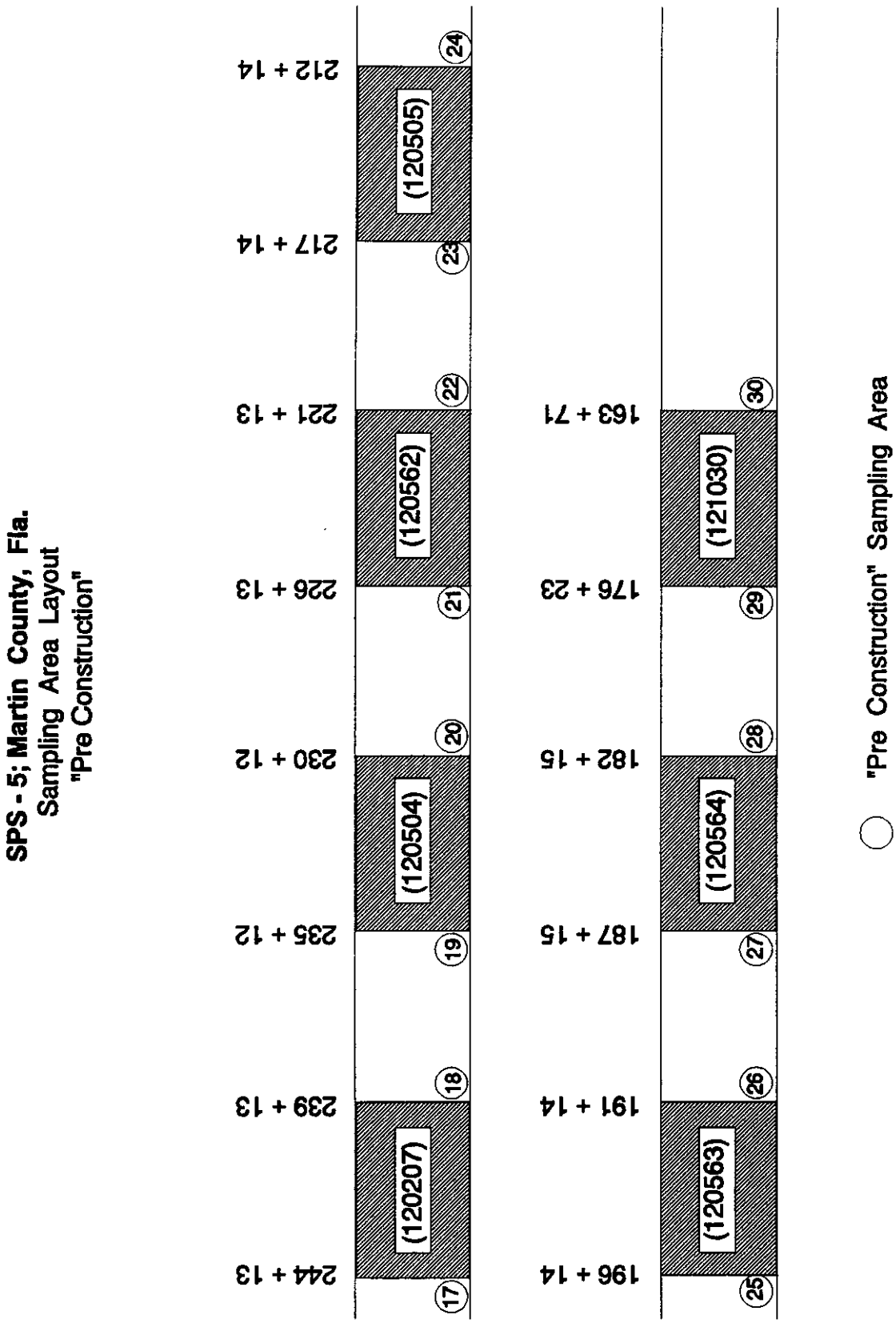


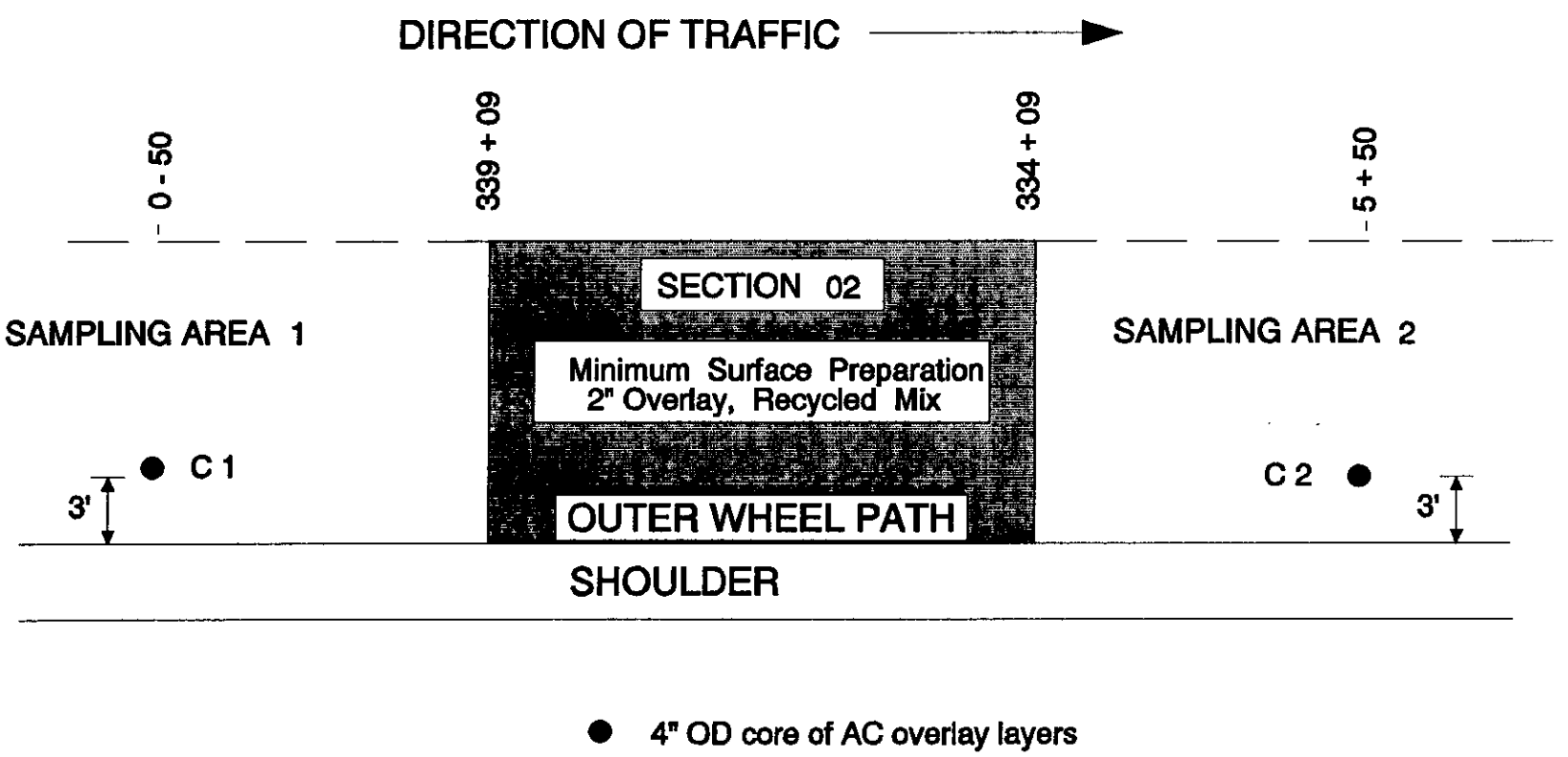
TABLE 5. BULK MATERIAL SAMPLING DURING CONSTRUCTION

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	Laydown Machine
2. Recycled Asphalt Concrete Mix	100 lb./Mix	Laydown Machine

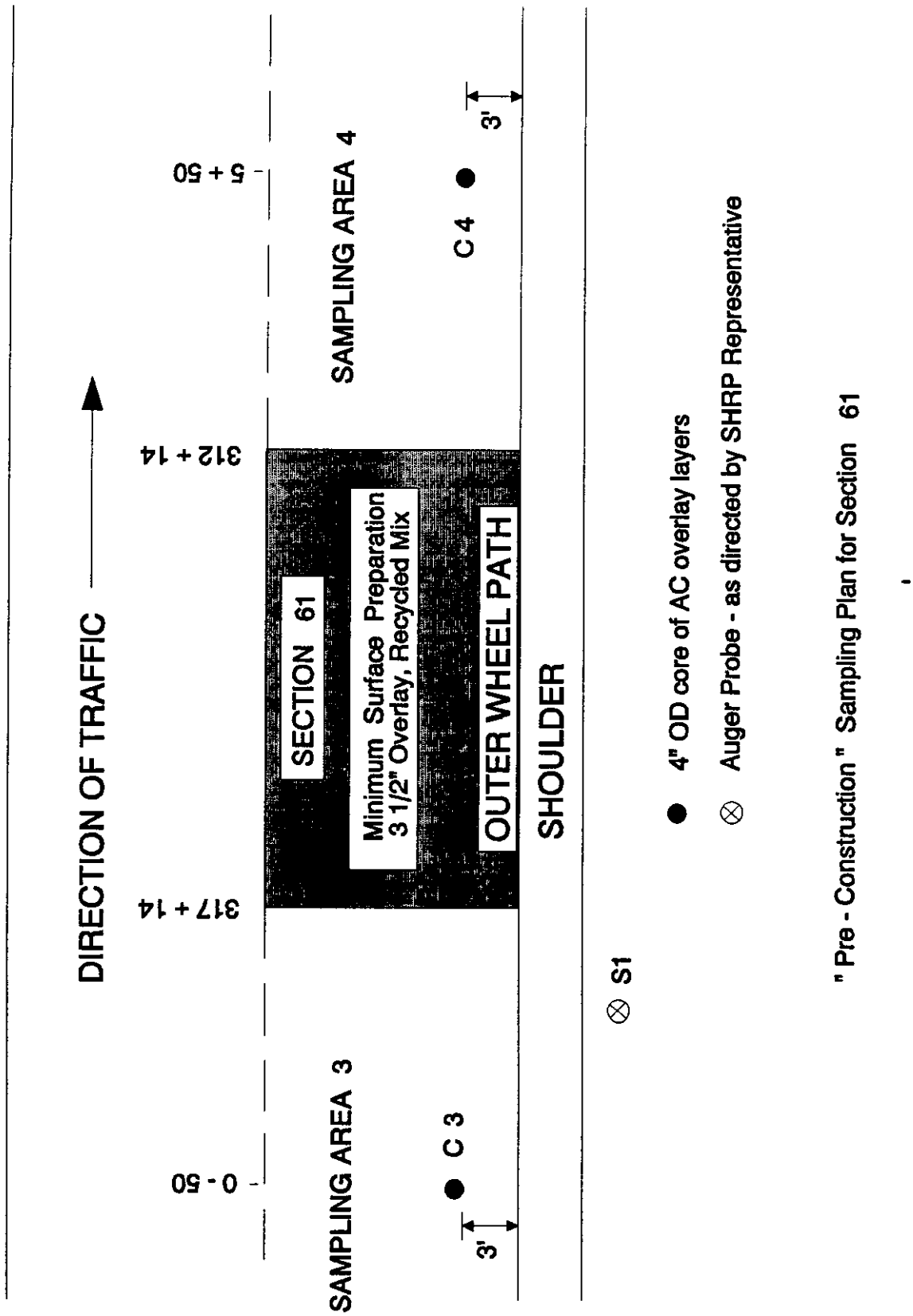

SPS - 5; Martin County, Fla.
Sampling Area Layout
"Pre Construction"
339 + 09
334 + 09
317 + 14
312 + 14
308 + 08
303 + 08
300 + 04
295 + 04
280 + 08
275 + 08
271 + 10
266 + 10
261 + 02
256 + 02
253 + 12
248 + 12
(120502)
(120561)
(120503)
(120508)
(120565)
(120509)
(120506)
(120566)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
"Pre Construction" Sampling Area

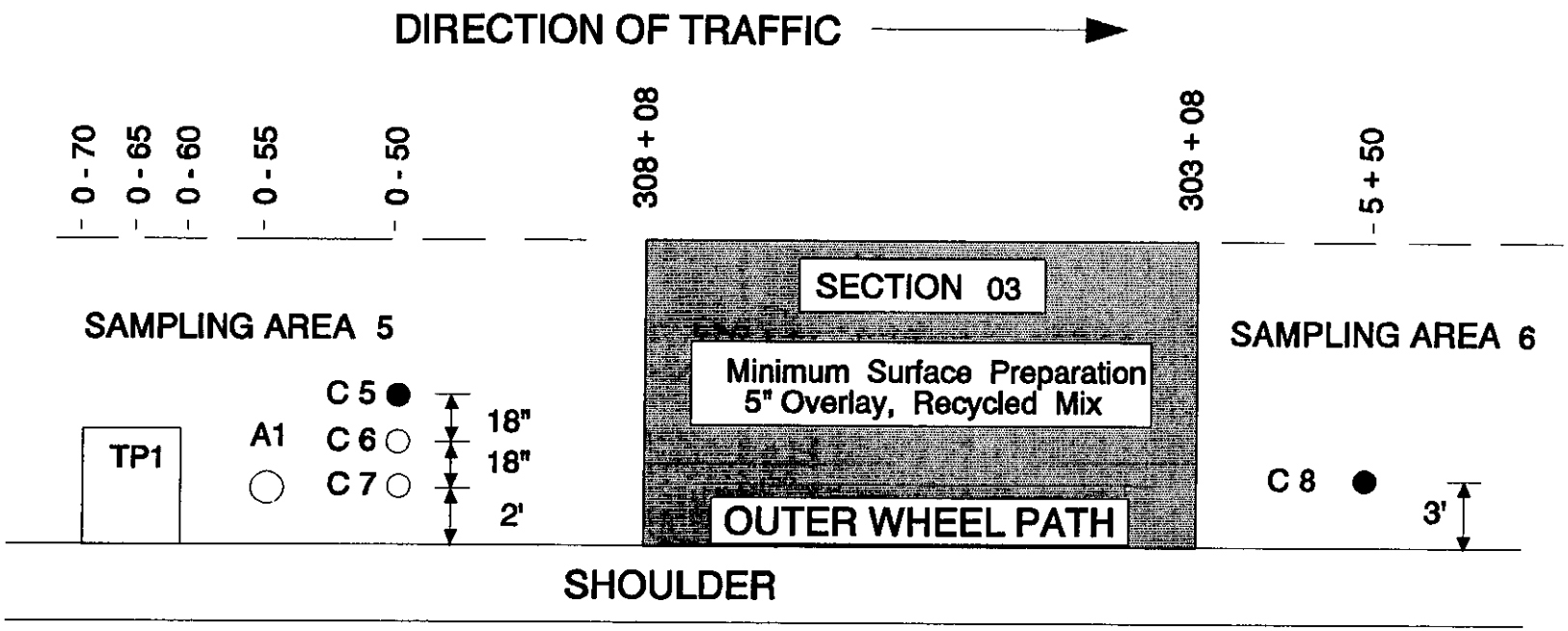

SPS - 5; Martin County, Fla.
Sampling Area Layout
"Pre Construction"
212 + 14
217 + 14
221 + 13
226 + 13
230 + 12
235 + 12
239 + 13
244 + 13
(120505)
(120562)
(120504)
(120207)
24
23
22
21
20
19
18
17
163 + 71
176 + 23
182 + 15
187 + 15
191 + 14
196 + 14
(121030)
(120564)
(120563)
30
29
28
27
26
25
"Pre Construction" Sampling Area



● 4" OD core of AC overlay layers

" Pre - Construction " Sampling Plan for Section 02


DIRECTION OF TRAFFIC
0 - 50
317 + 14
312 + 14
5 + 50
SAMPLING AREA 3
SAMPLING AREA 4
SECTION 61
Minimum Surface Preparation
3 1/2" Overlay, Recycled Mix
OUTER WHEEL PATH
SHOULDER
C 3
C 4
3'
3'
S1
4" OD core of AC overlay layers
Auger Probe - as directed by SHRP Representative
" Pre - Construction " Sampling Plan for Section 61



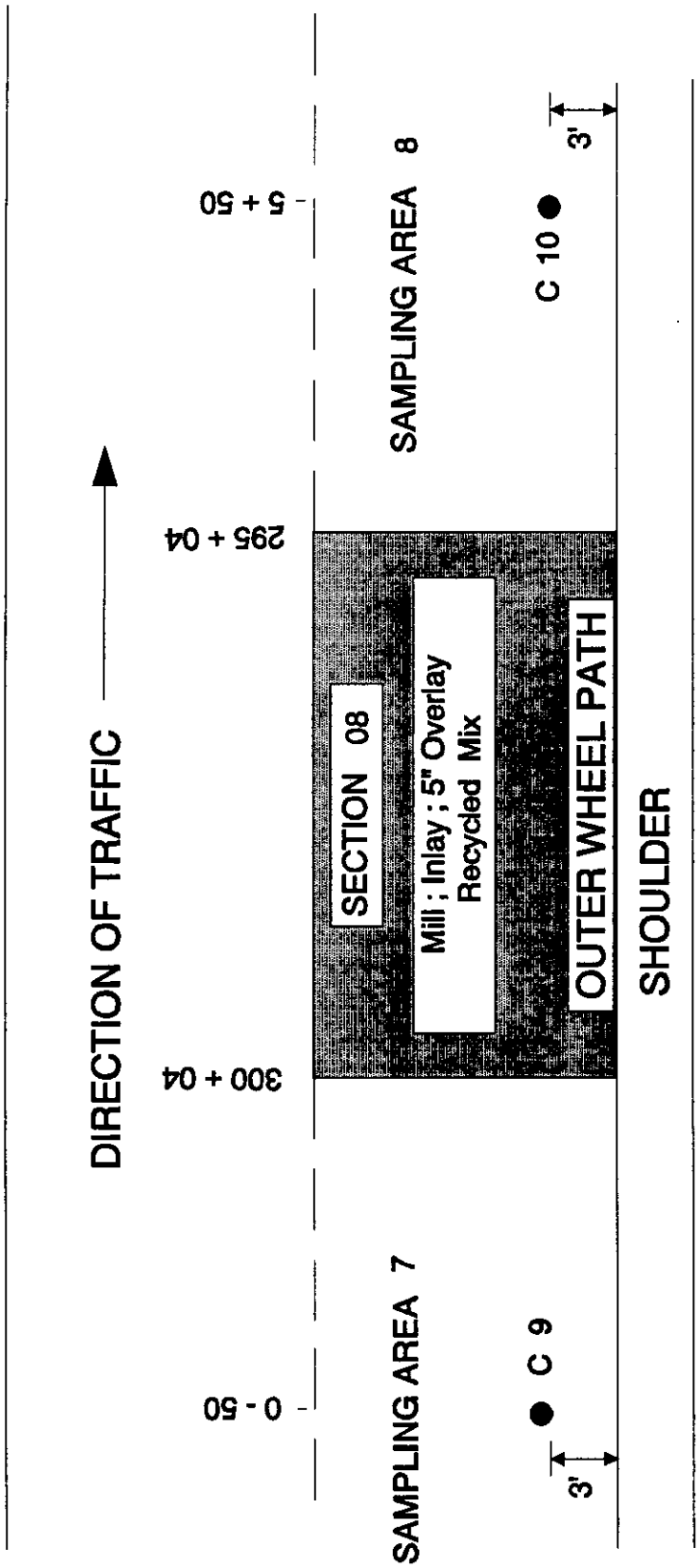
● 4" OD core of AC overlay layers

○ 4" OD core of AC pavement surface and treated layers

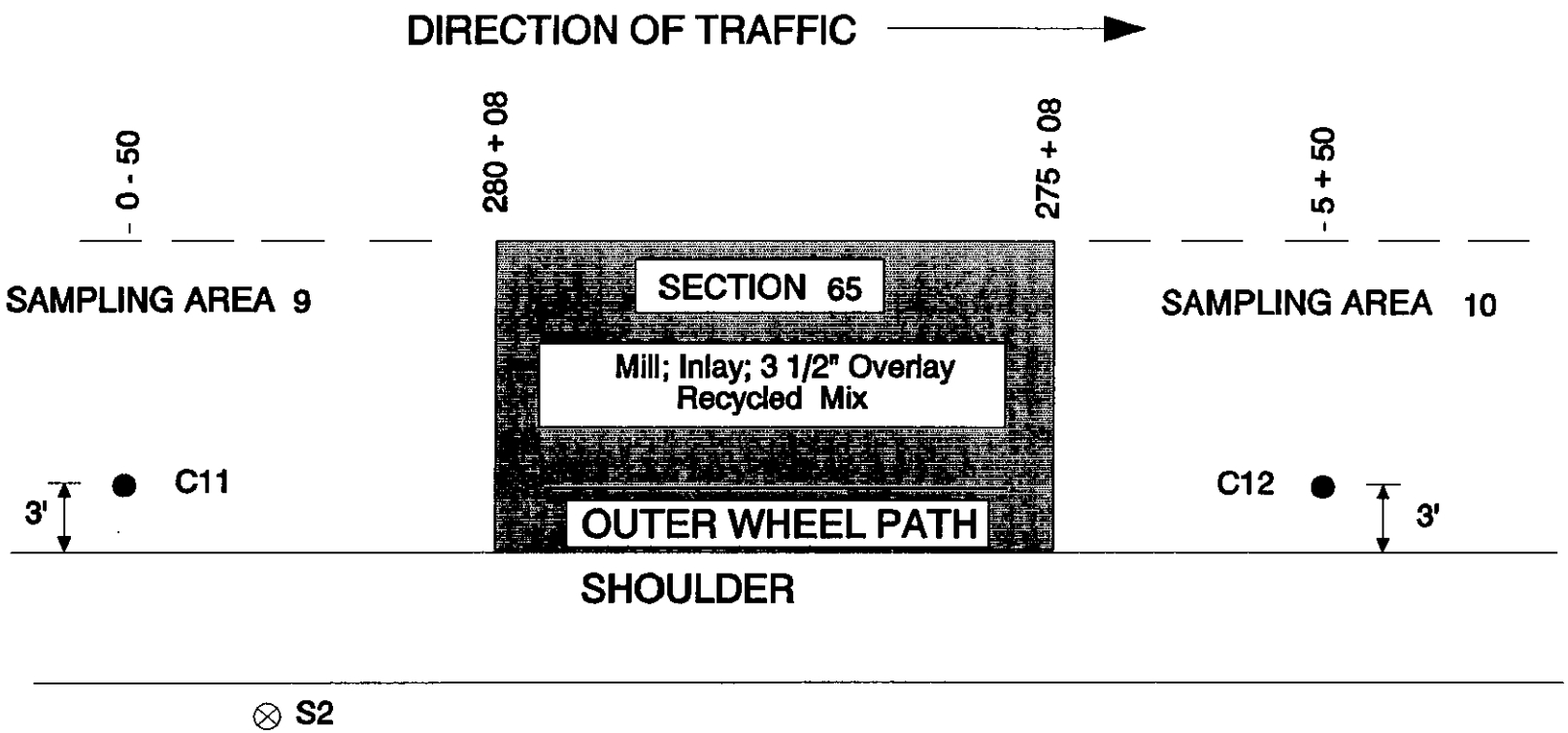
◯ 6" OD core of AC pavement surface and treated layers: augering of unbound granular base and subbase: thin-walled tube and / or splitspoon sampling as directed by SHRP Representative to 4' below top of subgrade.

TP — Test pit (4' x 6' x 12" below top of subgrade). Removal of pavement layers: collection of AC pavement blocks: nuclear density and moisture samples of unbound granular base and subbase layers and untreated subgrade: bulk sampling of unbound granular base and subbase layers treated and untreated subgrade.

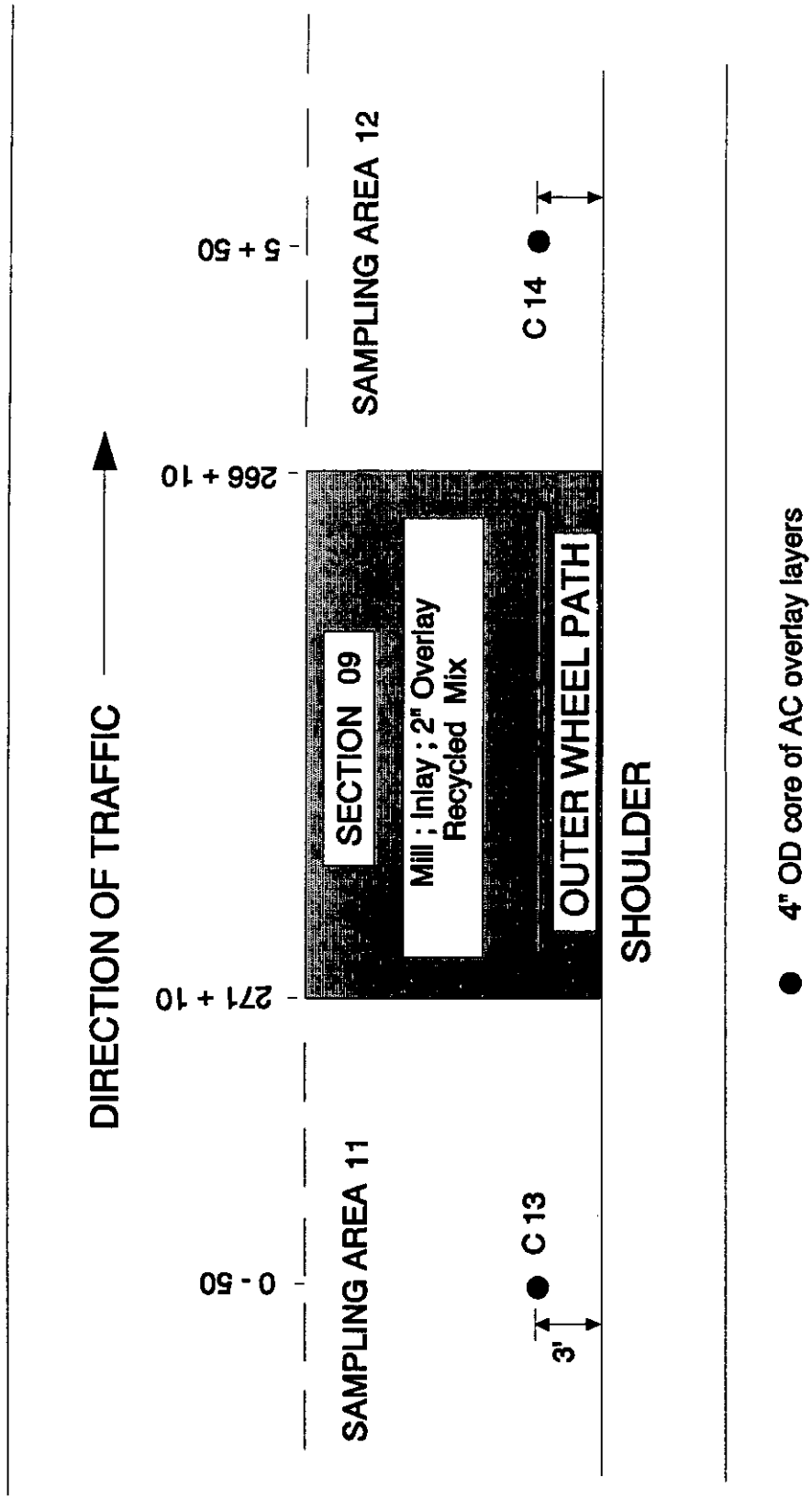
" Pre - Construction " Sampling Plan for Section 03



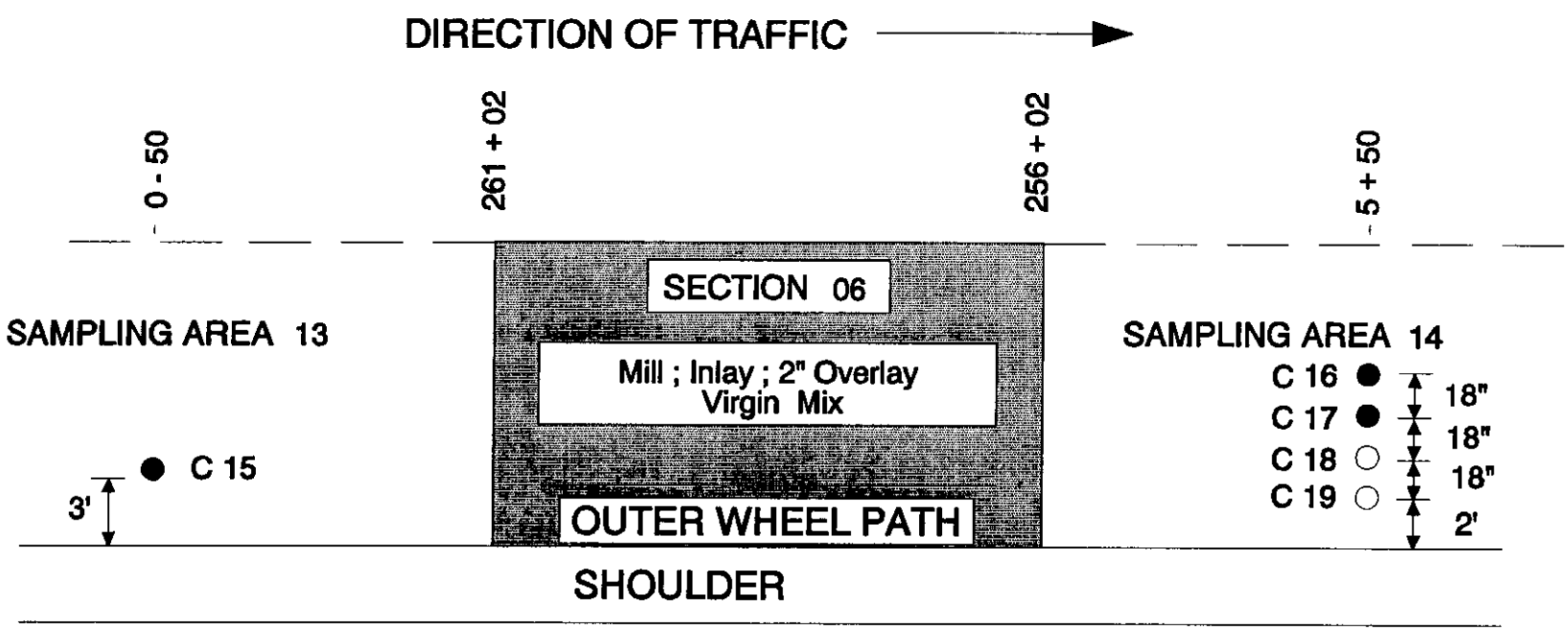
" Pre - Construction " Sampling Plan for Section 08



"Pre - Construction" Sampling Plan for Section 65



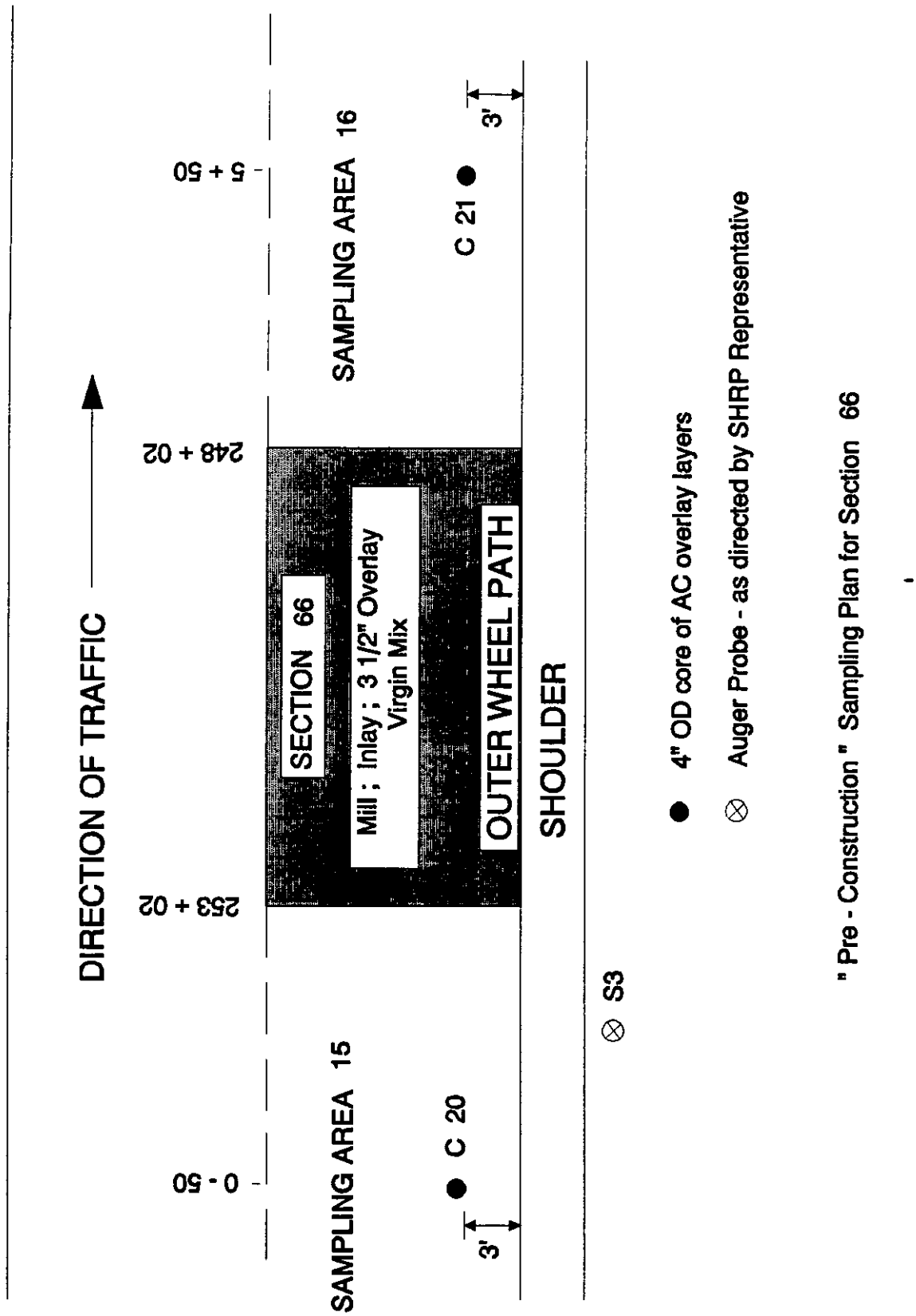
"Pre - Construction" Sampling Plan for Section 09

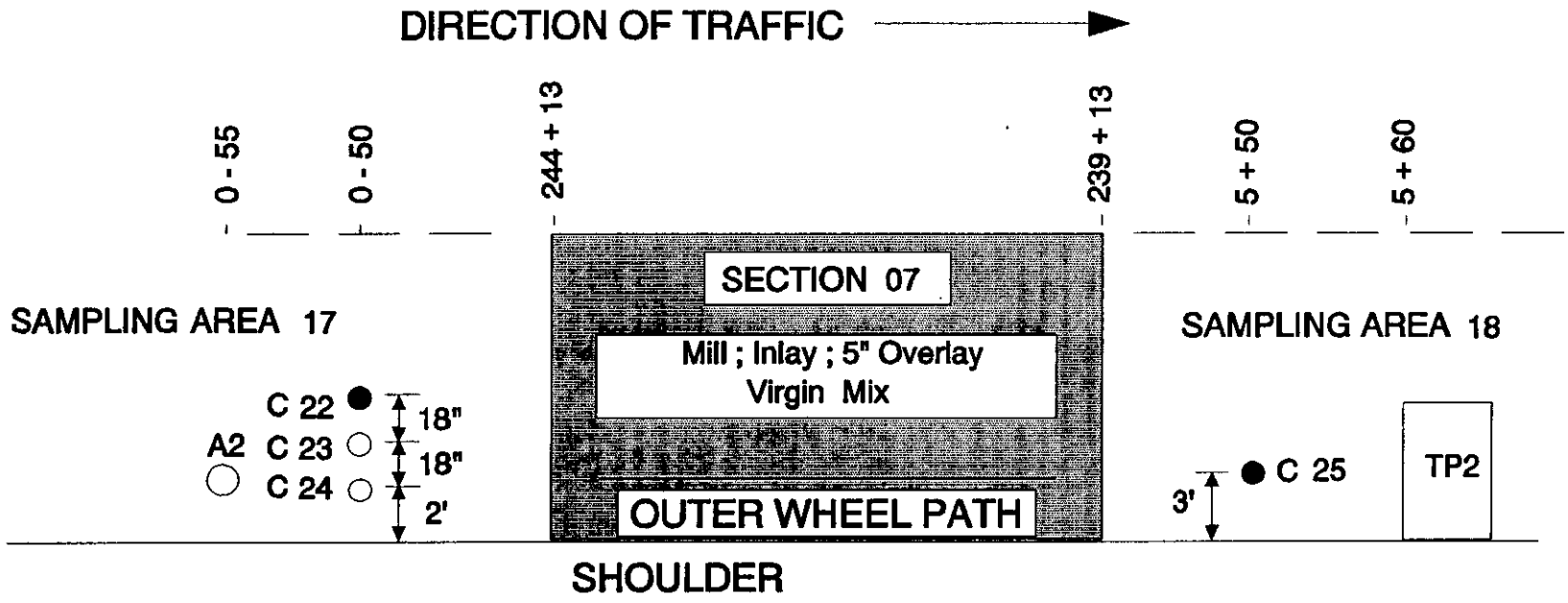


● 4" OD core of AC overlay layers

○ 4" OD core of AC pavement surface and treated layers

" Pre - Construction " Sampling Plan for Section 06


DIRECTION OF TRAFFIC
0 - 50
5 + 50
SAMPLING AREA 15
SAMPLING AREA 16
253 + 02
248 + 02
SECTION 66
Mill ; Inlay ; 3 1/2" Overlay
Virgin Mix
OUTER WHEEL PATH
SHOULDER
C 20
C 21
3'
3'
S3
4" OD core of AC overlay layers
Auger Probe - as directed by SHRP Representative
" Pre - Construction " Sampling Plan for Section 66



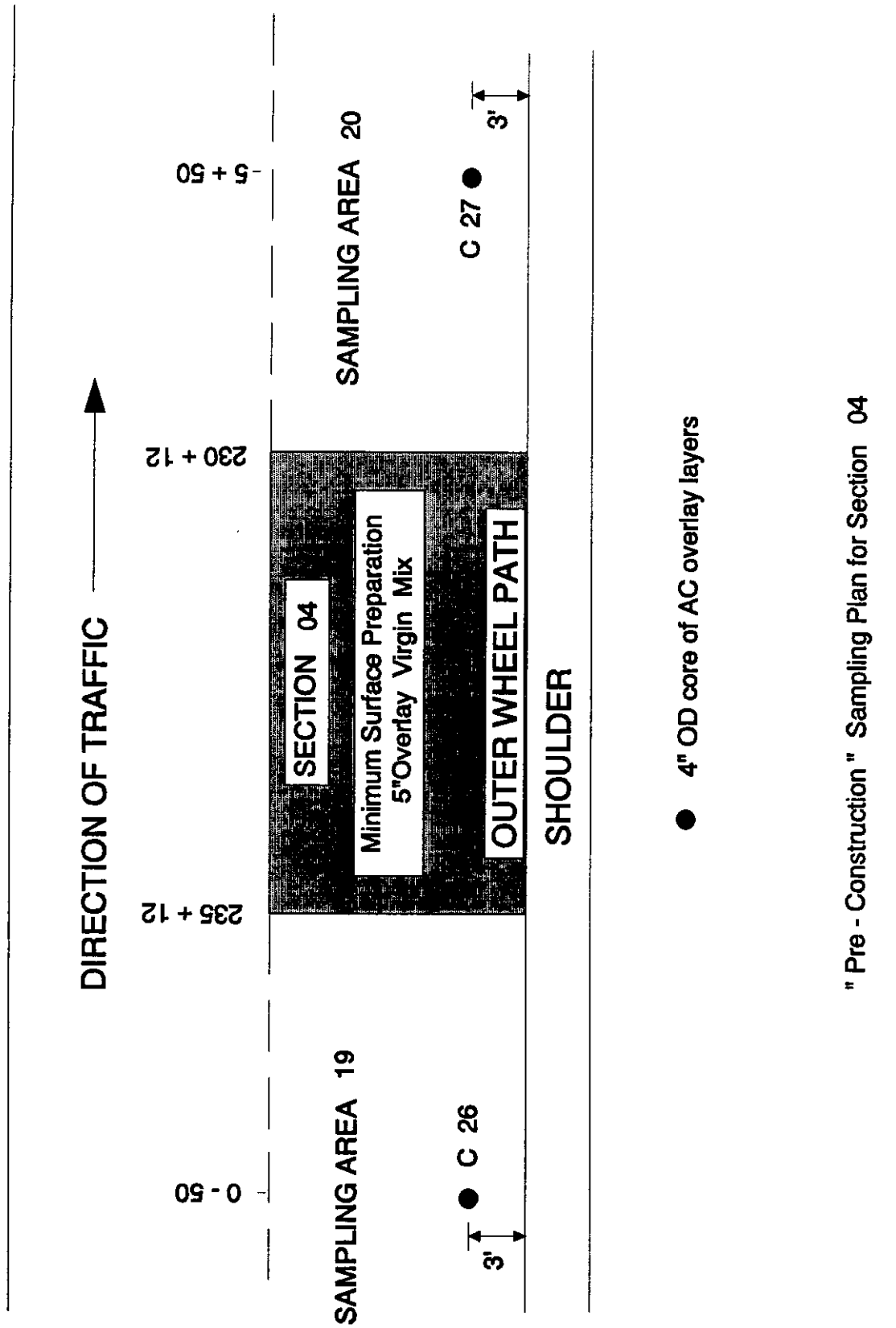
● 4" OD core of AC overlay layers

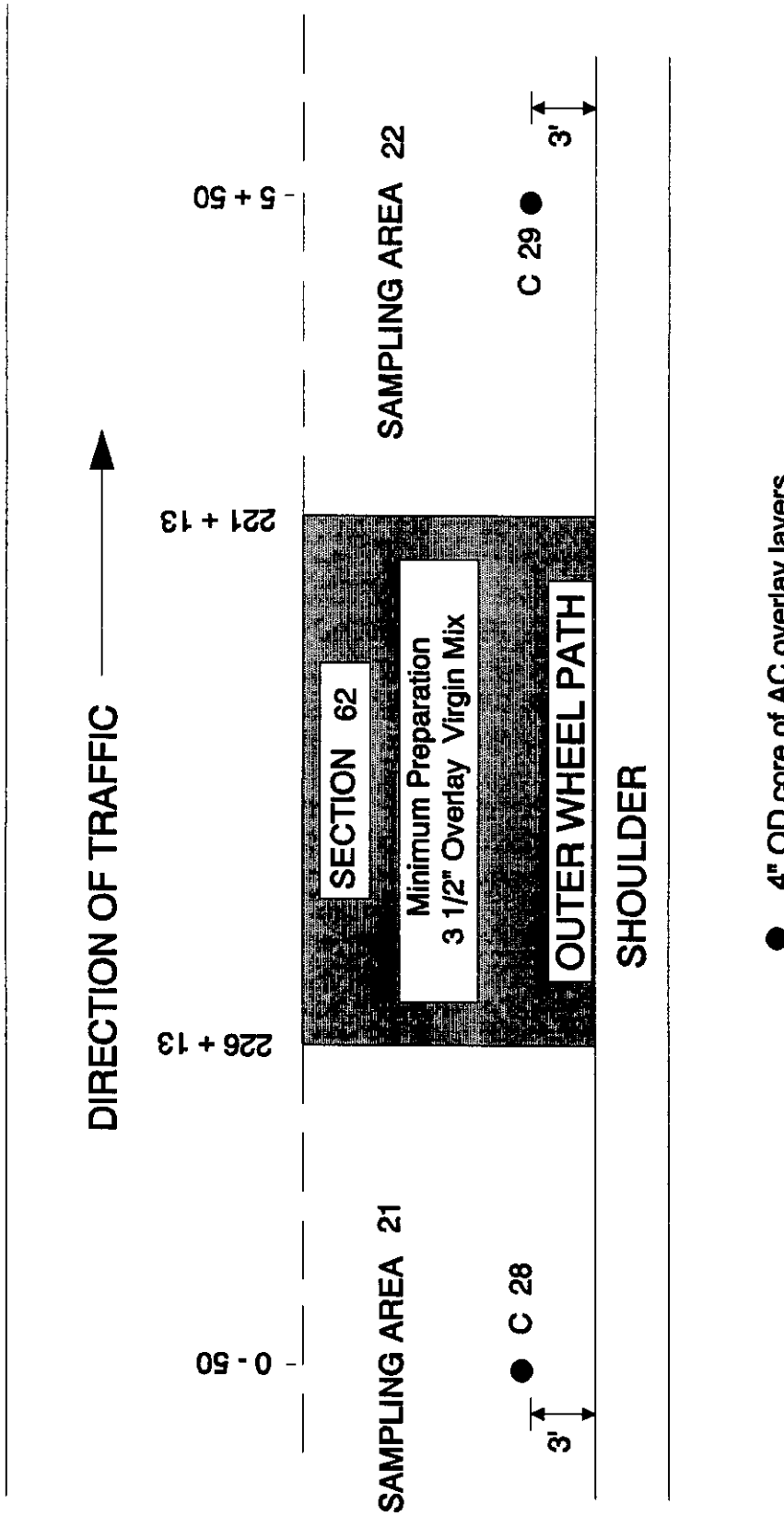
○ 4" OD core of AC pavement surface and treated layers

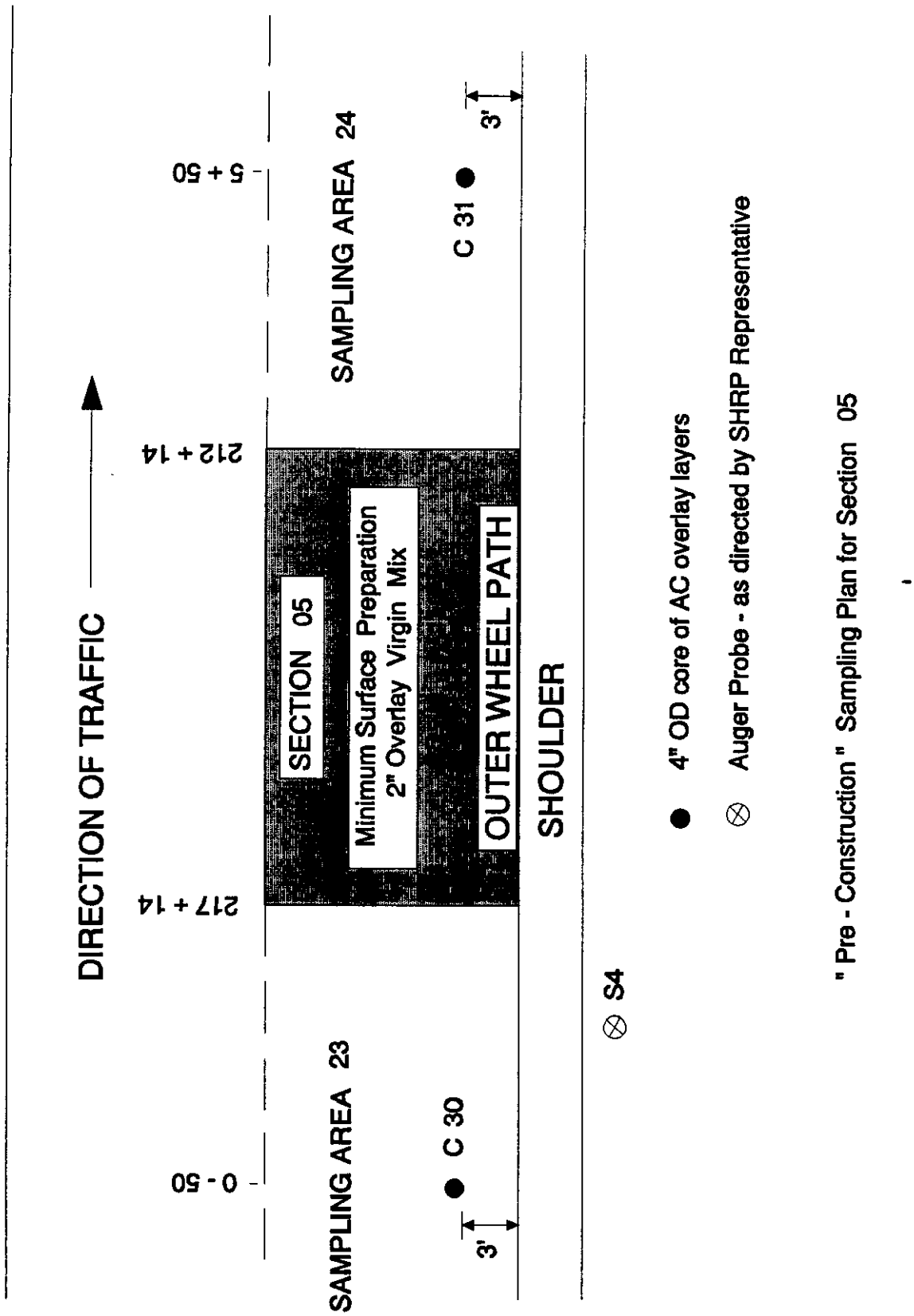
◯ 6" OD of AC pavement surface and treated layers ; augering of unbound granular base and subbase; thin-walled tube and/or splitspoon sampling as directed by SHRP Representative to 4' below top of subgrade.

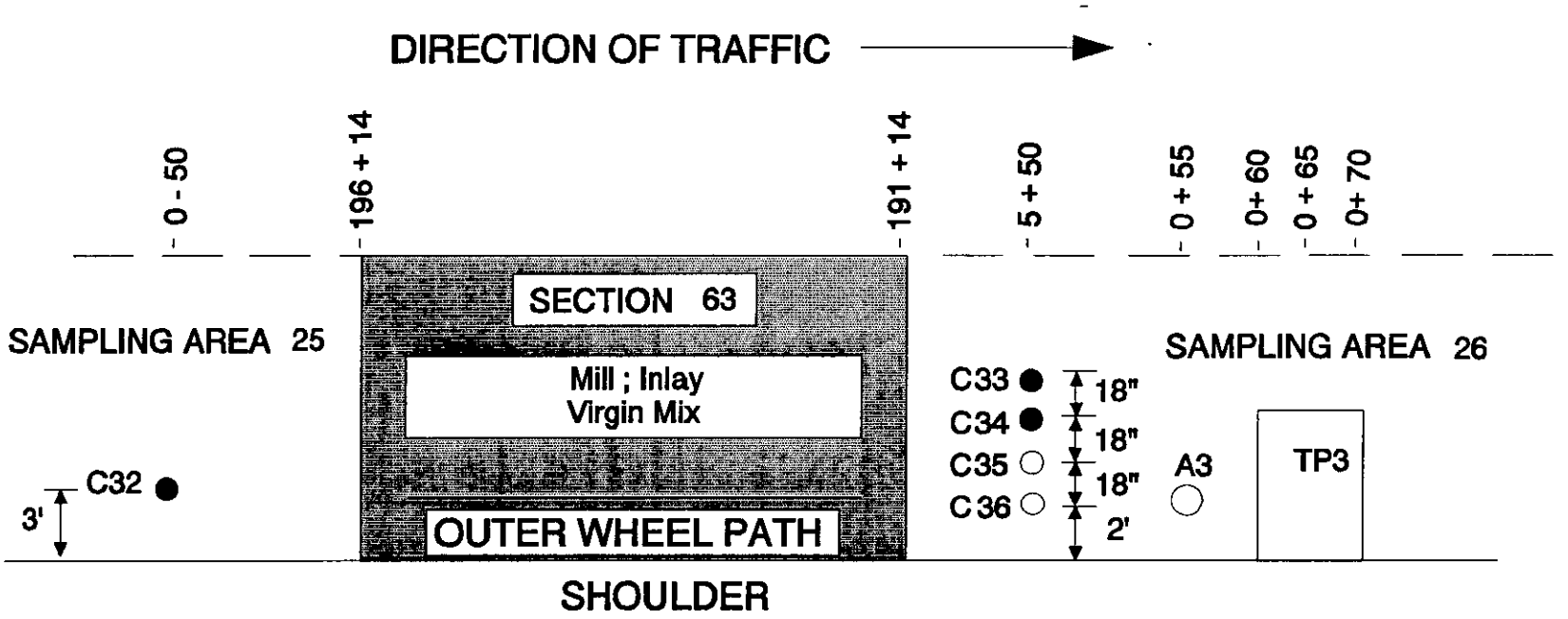
TP — Test pit (4' x 6' x 12" below top of subgrade). Removal of pavement layers: collection of AC pavement blocks: nuclear density and moisture samples of unbound granular base and subbase layers and untreated subgrade: bulk sampling of unbound granular base and subbase layers and untreated subgrade.

"Pre - Construction" Sampling Plan for Section 07


DIRECTION OF TRAFFIC
0 - 50
235 + 12
230 + 12
5 + 50
SAMPLING AREA 19
SAMPLING AREA 20
C 26
C 27
3'
3'
SECTION 04
Minimum Surface Preparation
5"Overlay Virgin Mix
OUTER WHEEL PATH
SHOULDER
4" OD core of AC overlay layers
" Pre - Construction " Sampling Plan for Section 04


DIRECTION OF TRAFFIC
0 - 50
5 + 50
221 + 13
226 + 13
SAMPLING AREA 21
SAMPLING AREA 22
C 28
C 29
3'
3'
SECTION 62
Minimum Preparation
3 1/2" Overlay Virgin Mix
OUTER WHEEL PATH
SHOULDER
4" OD core of AC overlay layers
" Pre - Construction " Sampling Plan for Section 62


DIRECTION OF TRAFFIC
0 - 50
5 + 50
212 + 14
217 + 14
SAMPLING AREA 23
SAMPLING AREA 24
C 30
C 31
3'
3'
SECTION 05
Minimum Surface Preparation
2" Overlay Virgin Mix
OUTER WHEEL PATH
SHOULDER
S4
4" OD core of AC overlay layers
Auger Probe - as directed by SHRP Representative
" Pre - Construction " Sampling Plan for Section 05



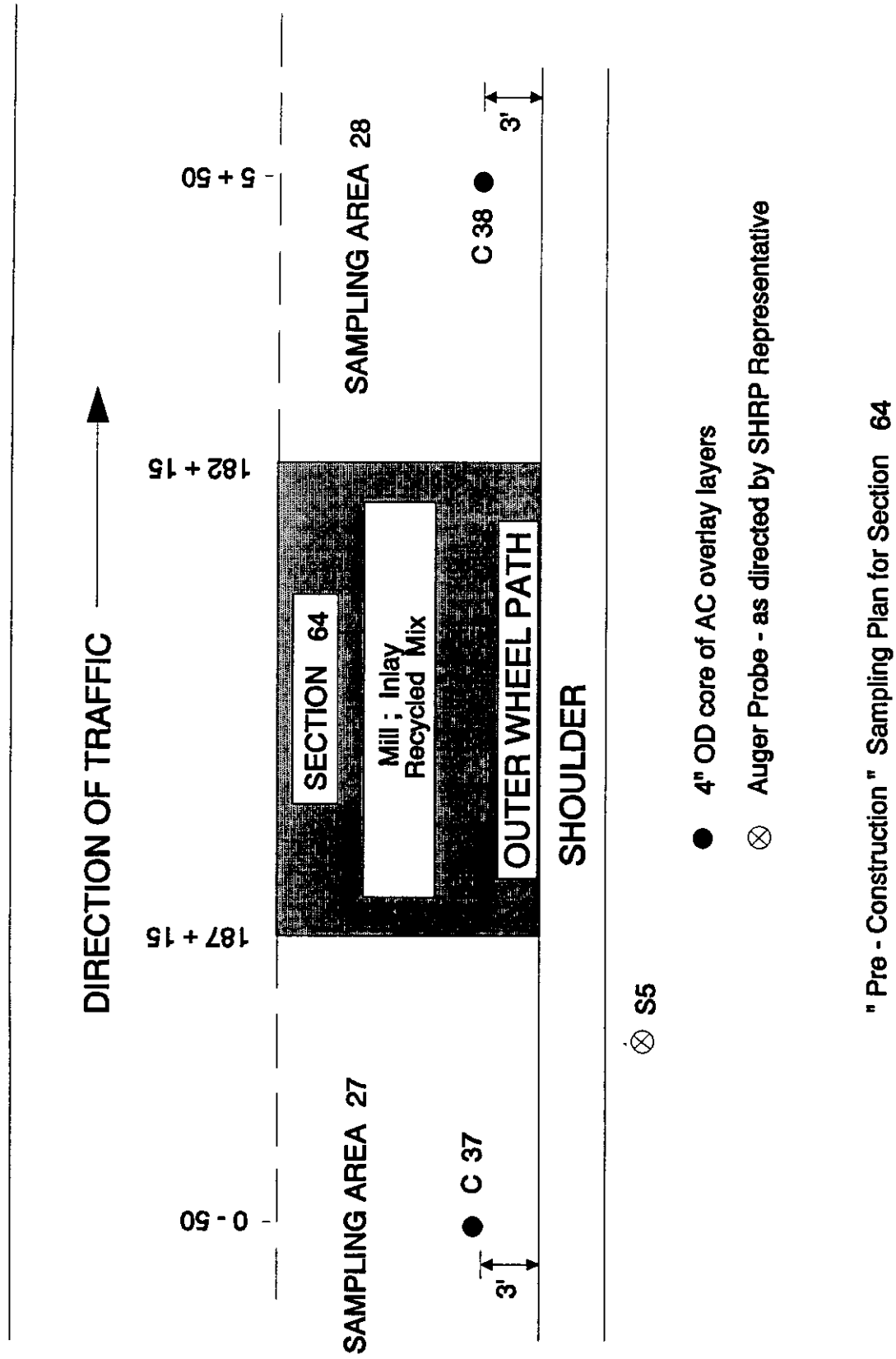
● 4" OD core of AC overlay layers

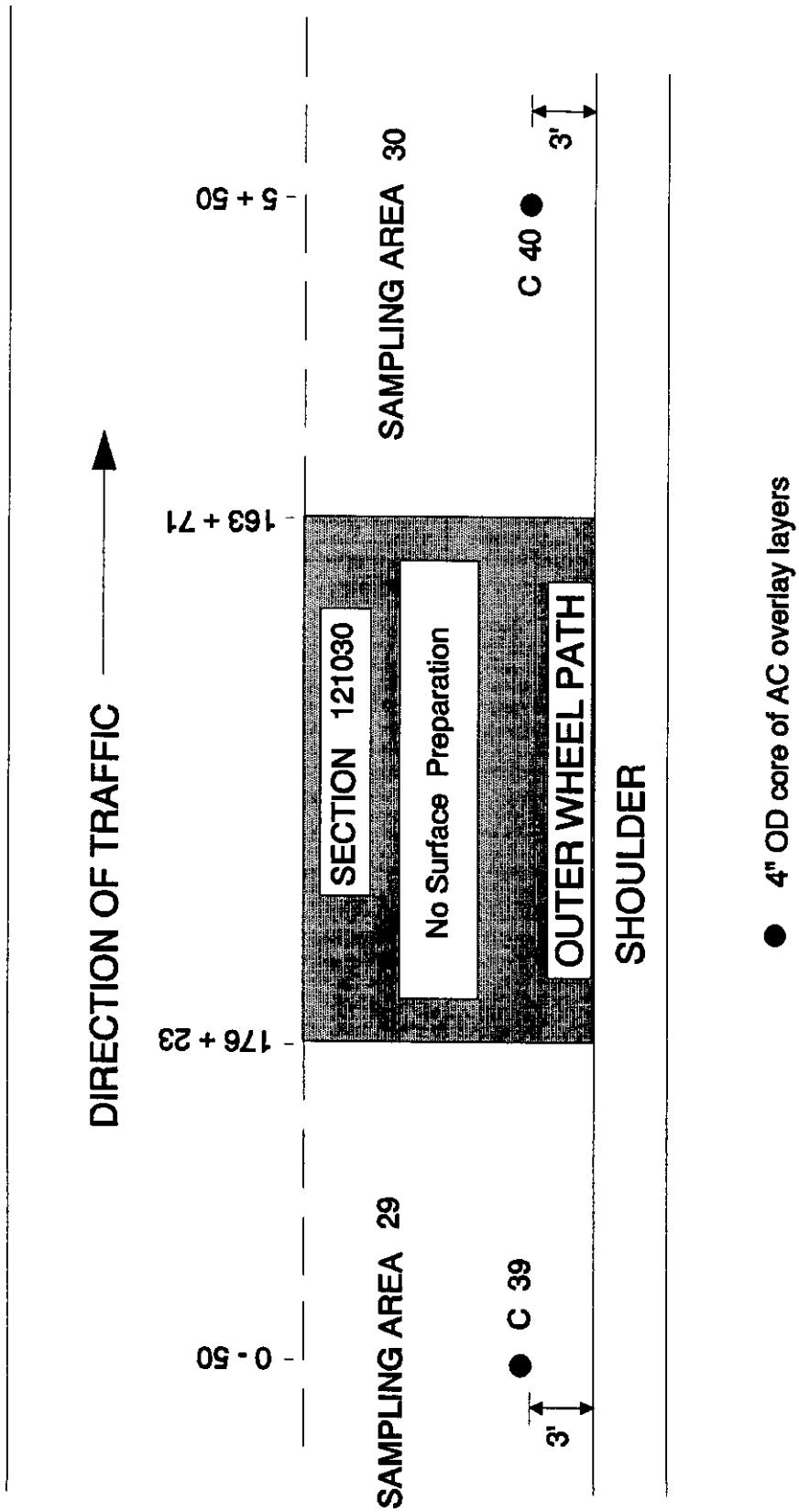
○ 4" OD core of AC pavement surface and treated layers

◯ 6" OD of AC pavement surface and treated layers ; augering of unbound granular base and subbase; thin-walled tube and/or splitspoon sampling as directed by SHRP Representative to 4' below top of subgrade.

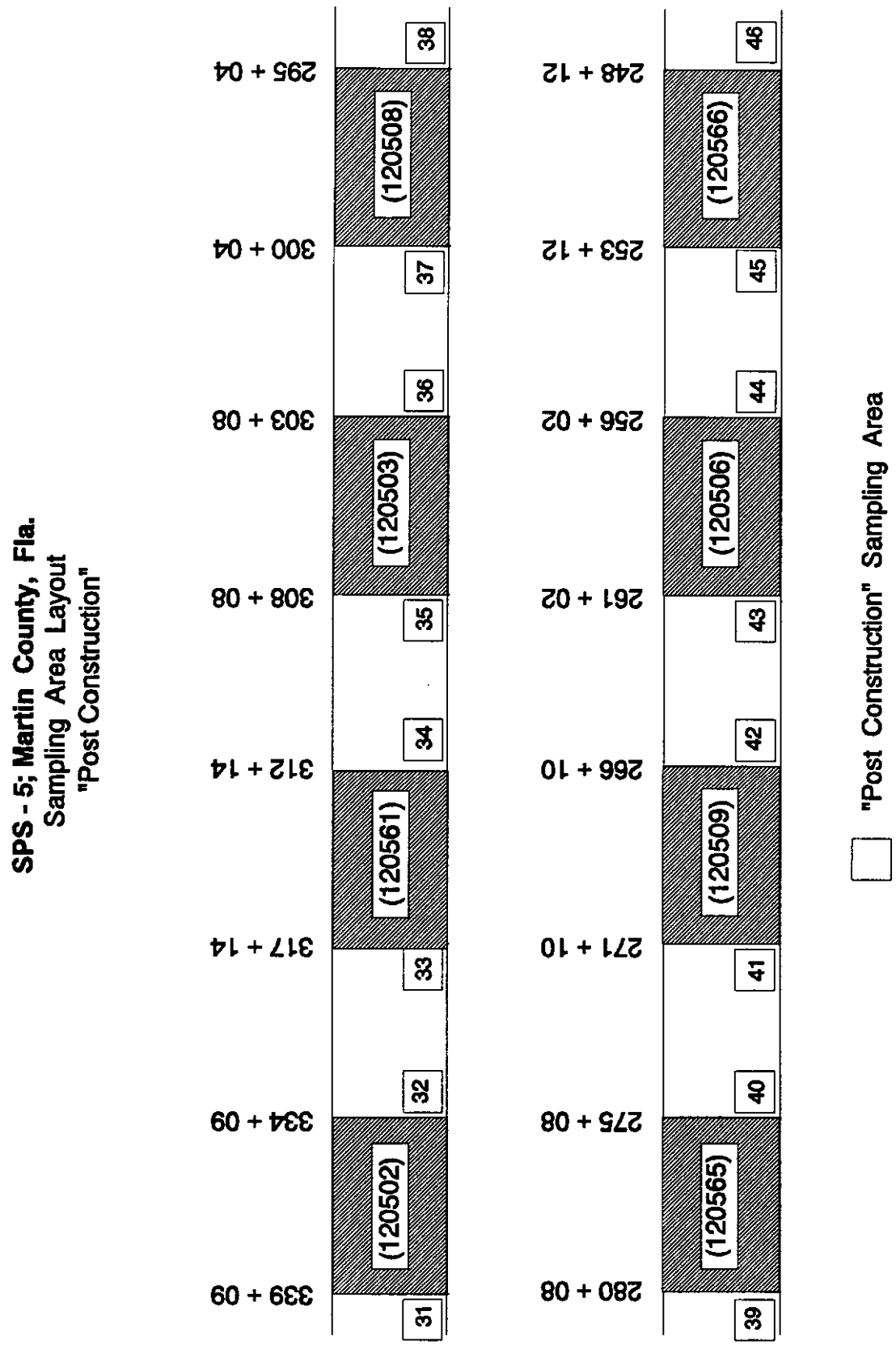
TP — Test pit (4' x 6' x 12") below top of subgrade). Removal of pavement layers: collection of AC pavement blocks: nuclear density and moisture samples of unbound granular base and subbase layers and untreated subgrade: bulk sampling of unbound granular base and subbase layers and untreated subgrade.

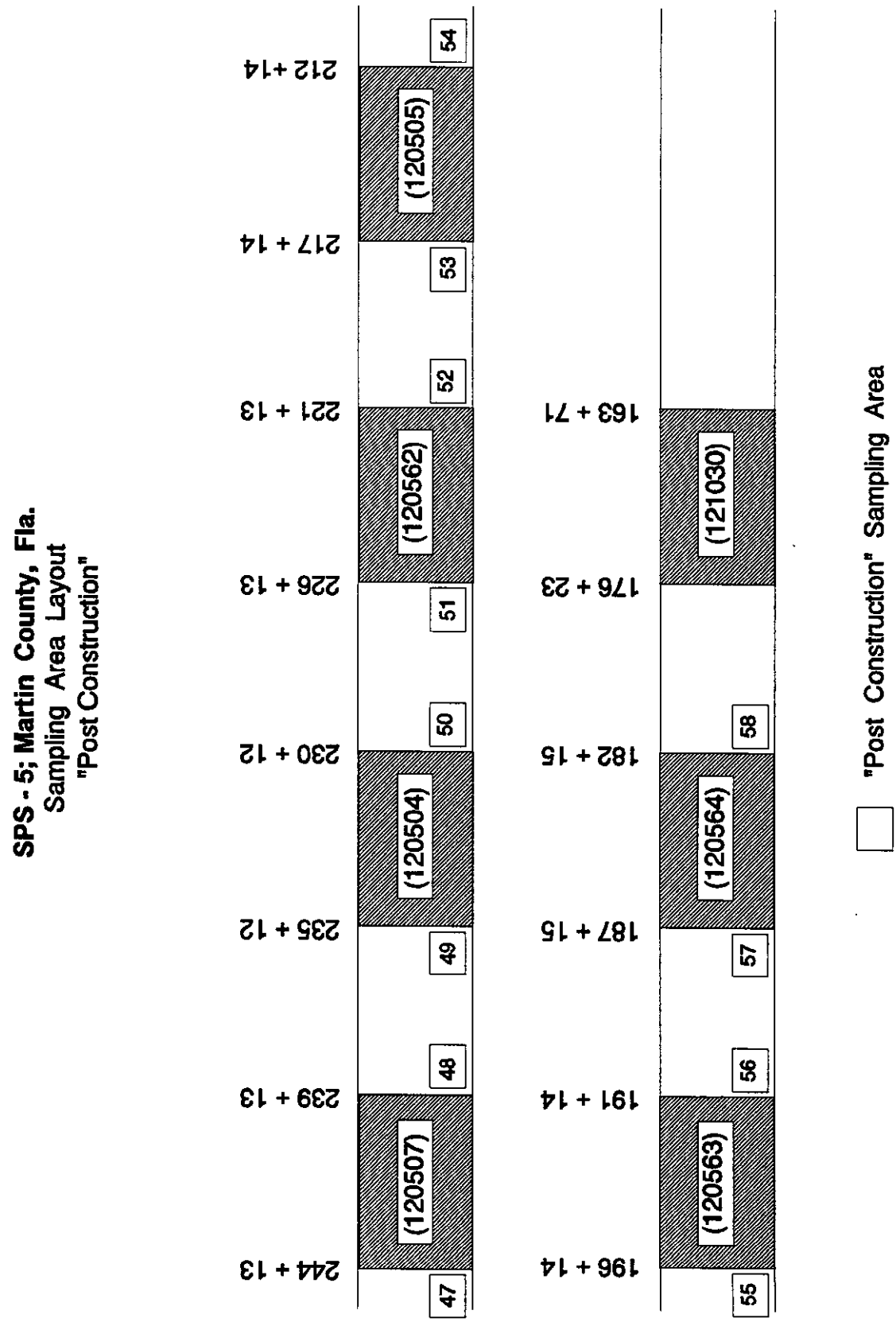
"Pre - Construction" Sampling Plan for Section 63

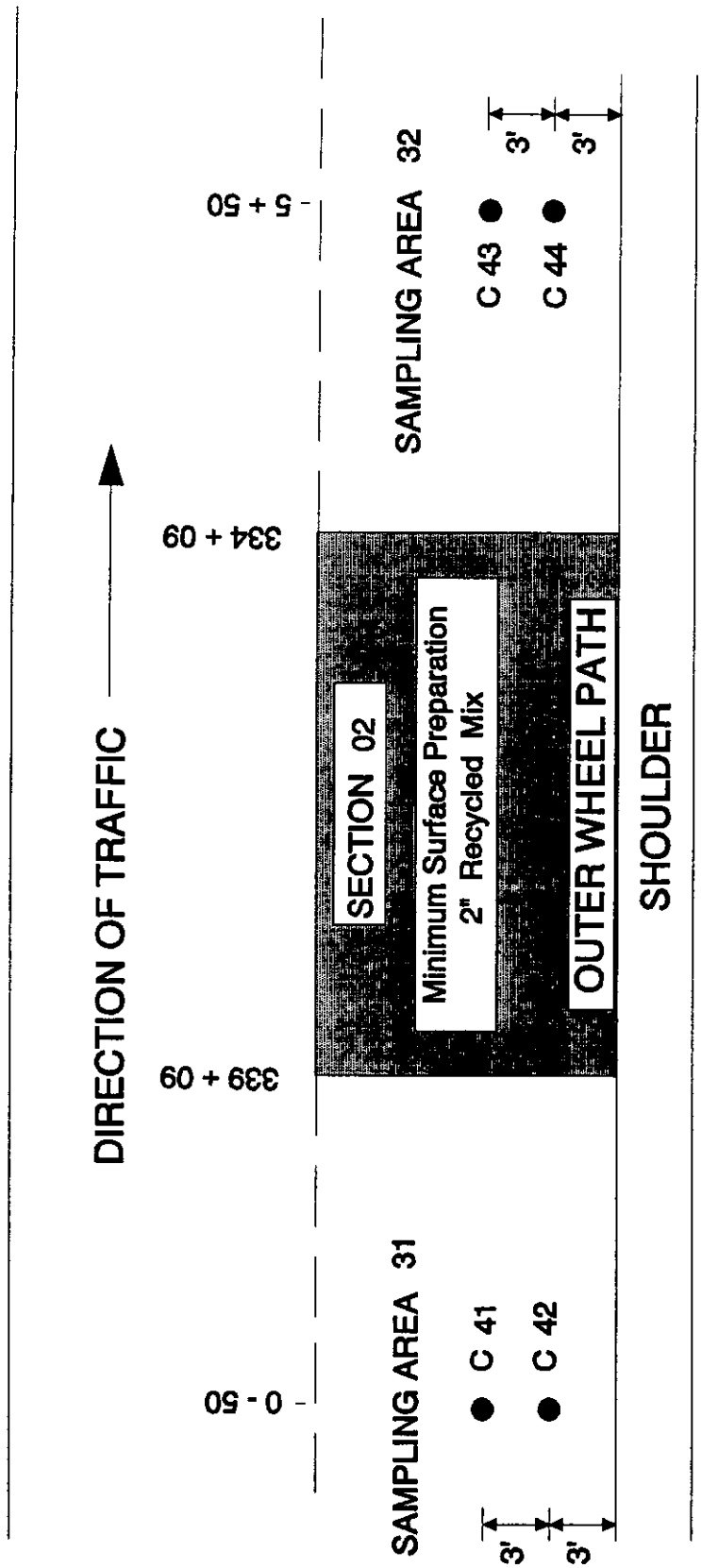

DIRECTION OF TRAFFIC
0 - 50
187 + 15
182 + 15
5 + 50
SAMPLING AREA 27
SAMPLING AREA 28
C 37
C 38
3'
3'
SECTION 64
Mill ; Inlay
Recycled Mix
OUTER WHEEL PATH
SHOULDER
S5
4" OD core of AC overlay layers
Auger Probe - as directed by SHRP Representative
" Pre - Construction " Sampling Plan for Section 64



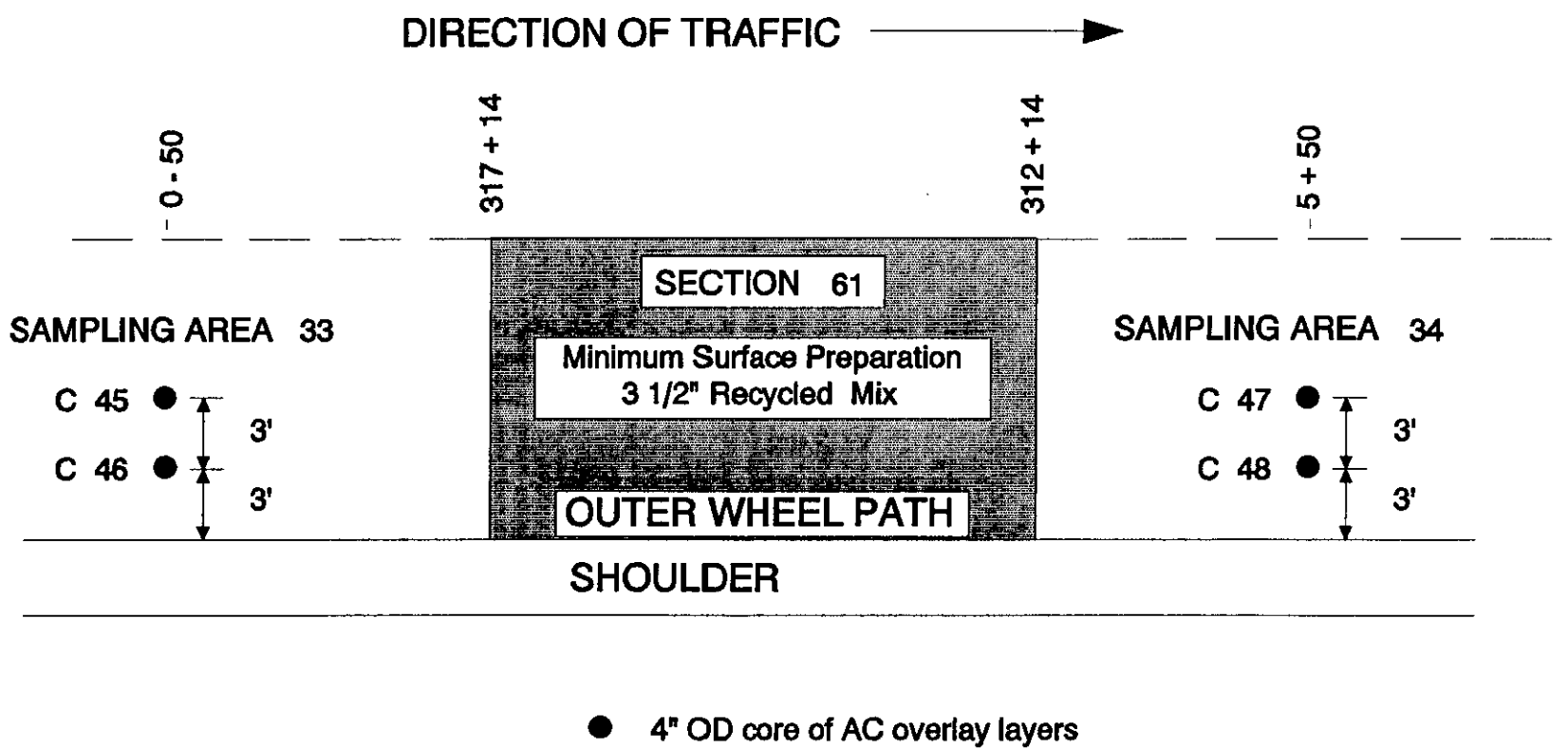
" Pre - Construction " Sampling Plan for Section 121030


SPS - 5; Martin County, Fla.
Sampling Area Layout
"Post Construction"
339 + 09
334 + 09
317 + 14
312 + 14
308 + 08
303 + 08
300 + 04
295 + 04
280 + 08
275 + 08
271 + 10
266 + 10
261 + 02
256 + 02
253 + 12
248 + 12
(120502)
(120561)
(120503)
(120508)
(120565)
(120509)
(120506)
(120566)
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
"Post Construction" Sampling Area


SPS - 5; Martin County, Fla.
Sampling Area Layout
"Post Construction"
212 + 14
217 + 14
221 + 13
226 + 13
230 + 12
235 + 12
239 + 13
244 + 13
163 + 71
176 + 23
182 + 15
187 + 15
191 + 14
196 + 14
(120505)
(120562)
(120504)
(120507)
(121030)
(120564)
(120563)
54
53
52
51
50
49
48
47
58
57
56
55
"Post Construction" Sampling Area

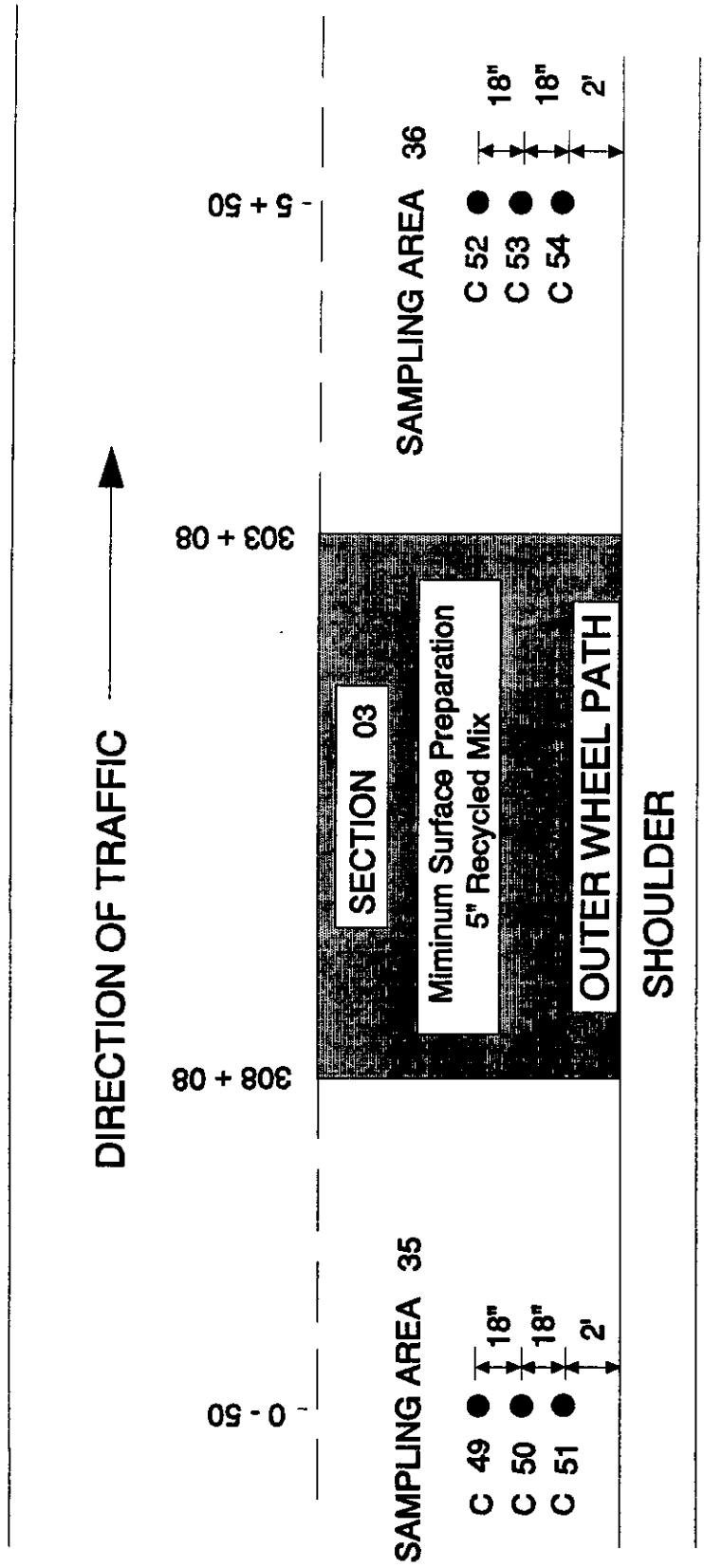


"Post - Construction" Sampling Plan for Section 02

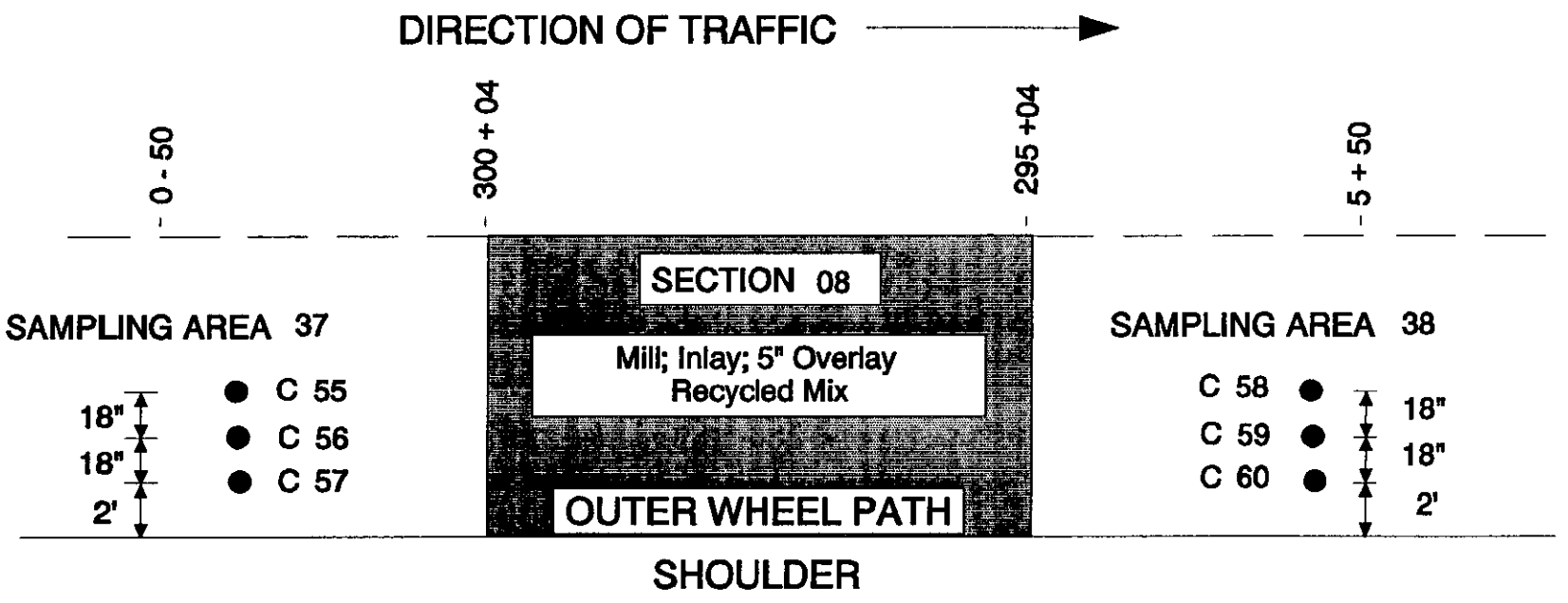


● 4" OD core of AC overlay layers

"Post - Construction" Sampling Plan for Section 61

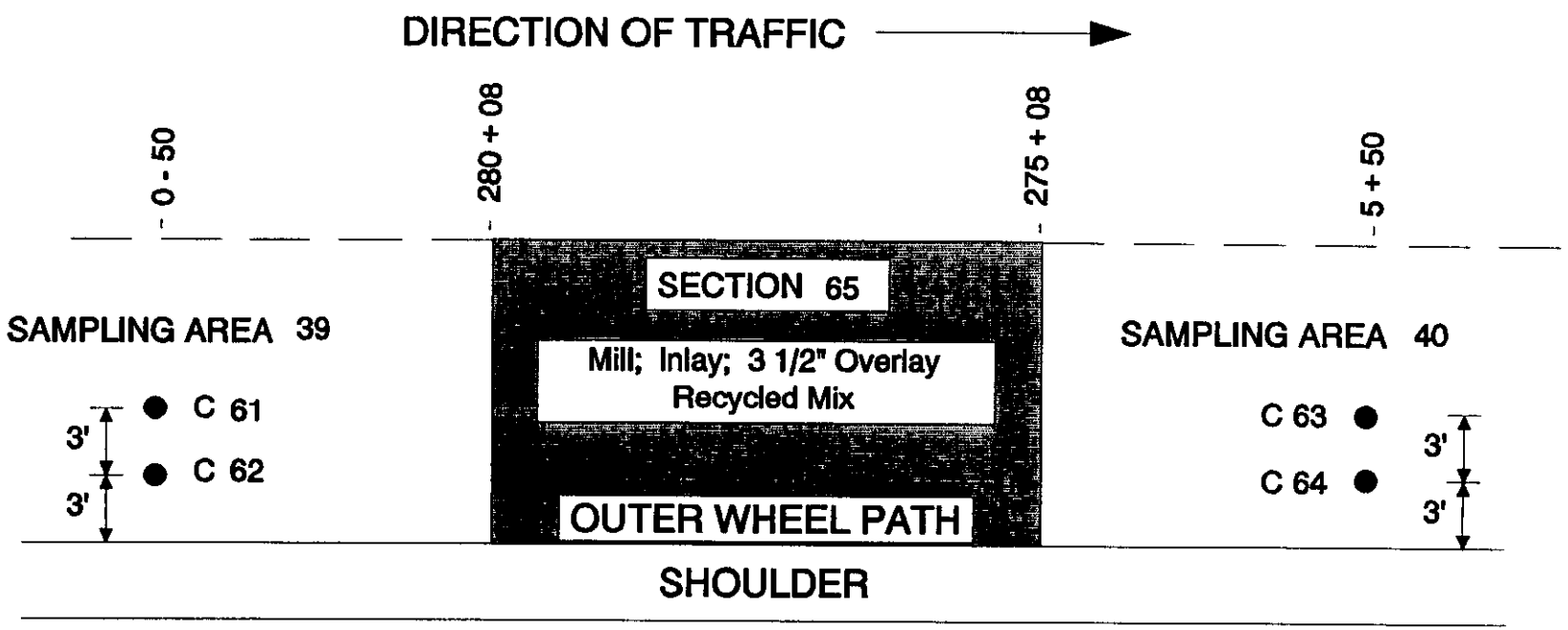


"Post - Construction" Sampling Plan for Section 03



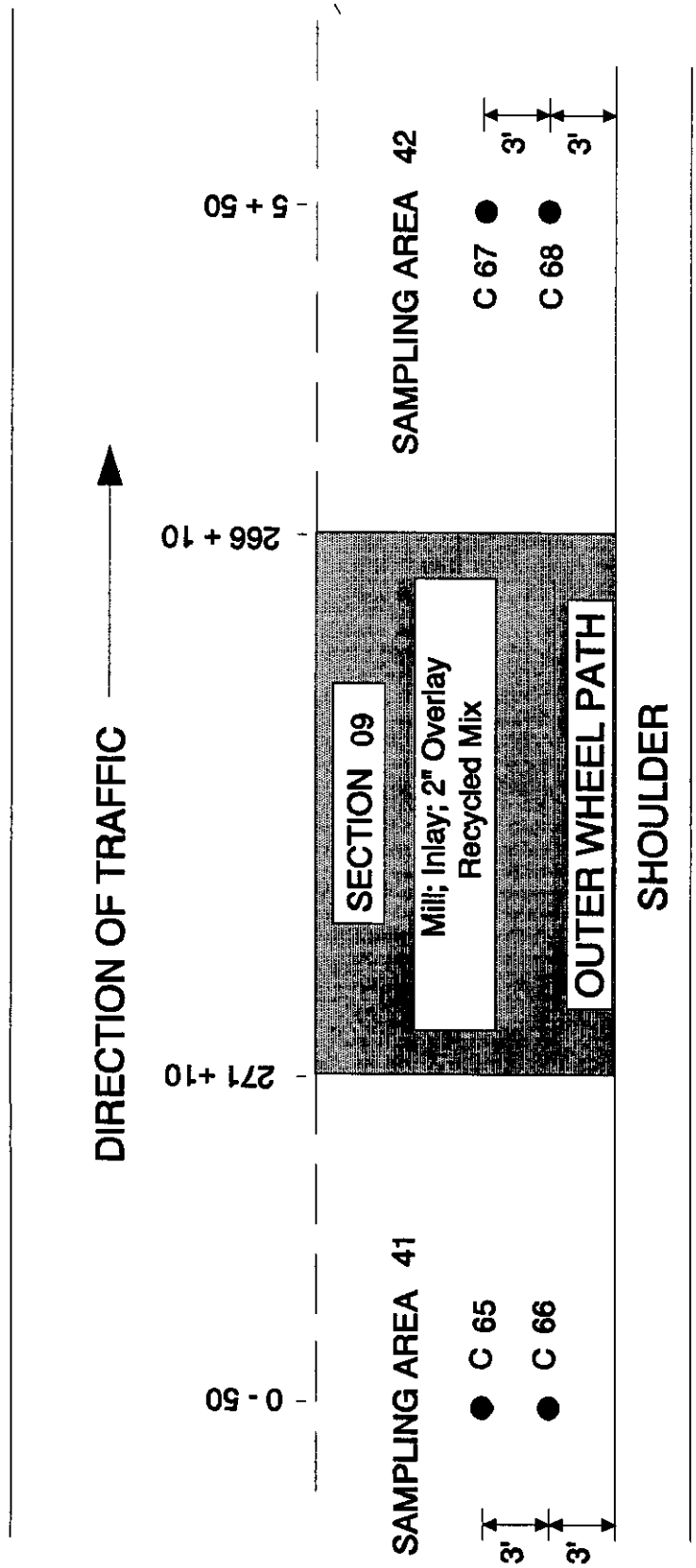
● 4" OD core of AC overlay layers

"Post - Construction" Sampling Plan for Section 08

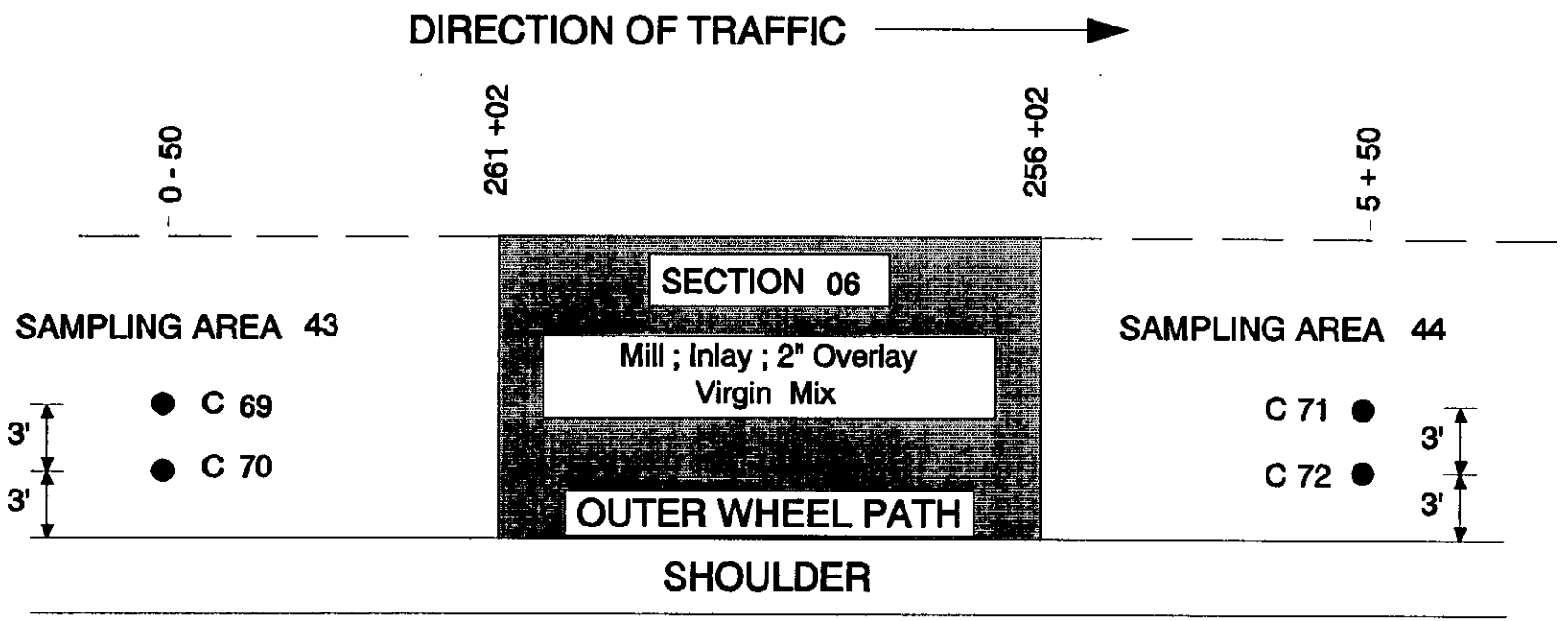


● 4" OD core of AC overlay layers

"Post - Construction" Sampling Plan for Section 65

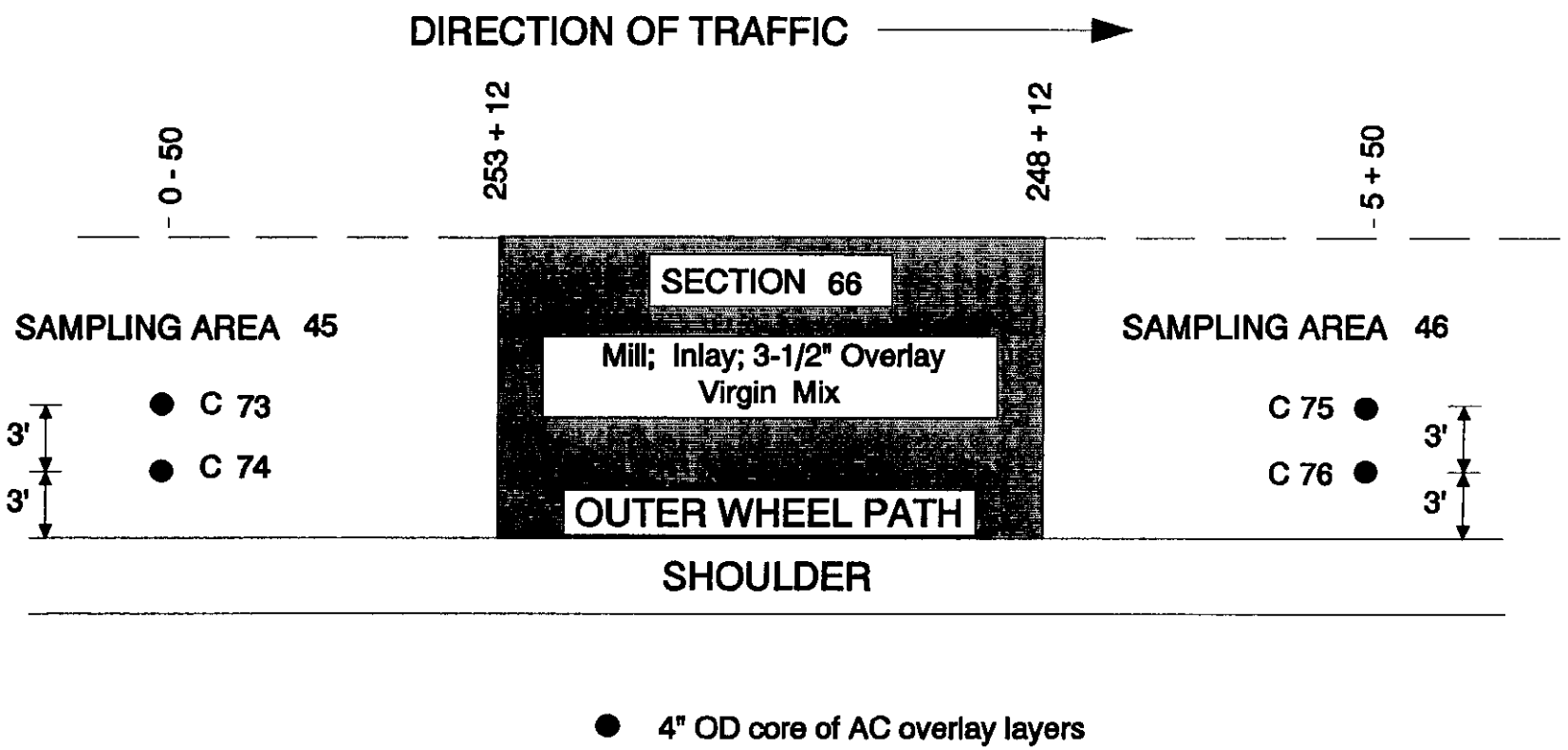


"Post - Construction" Sampling Plan for Section 09



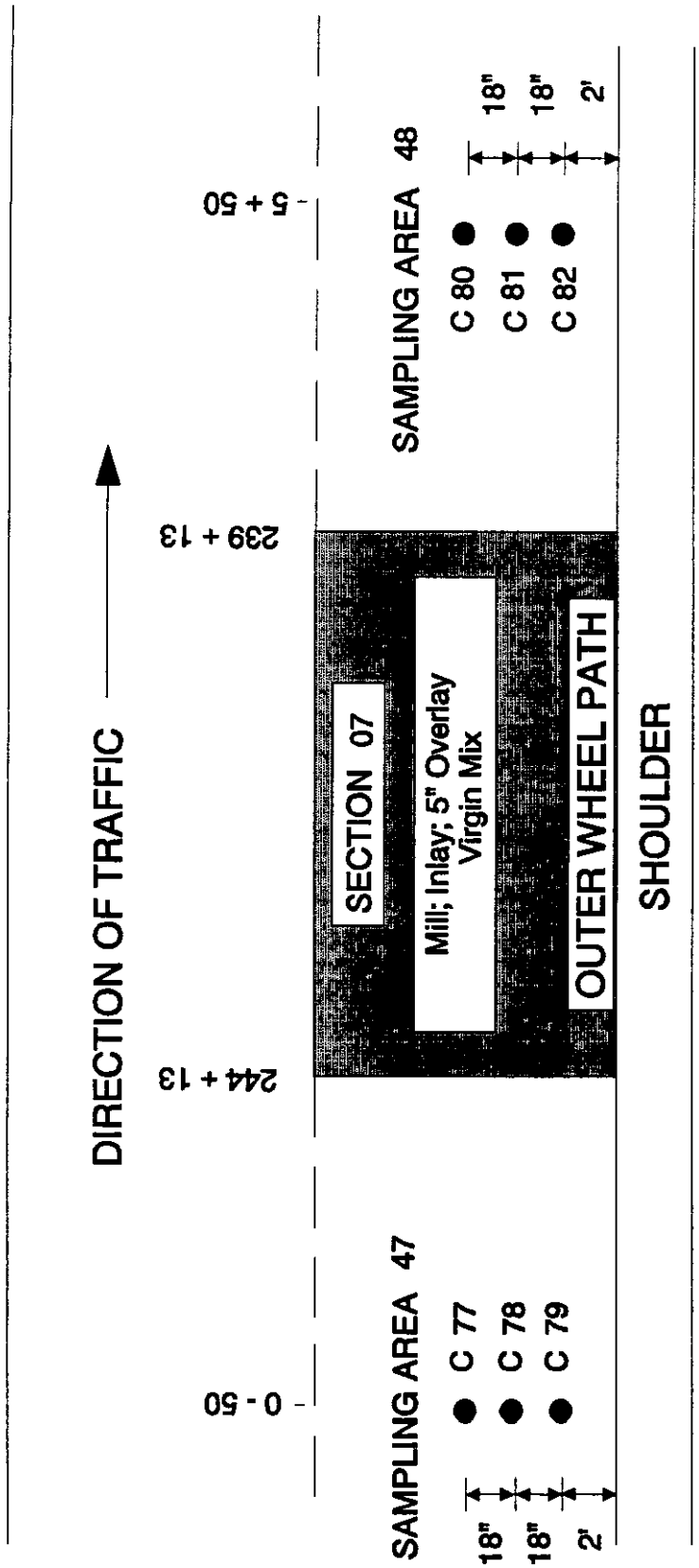
● 4" OD core of AC overlay layers

"Post - Construction" Sampling Plan for Section 06

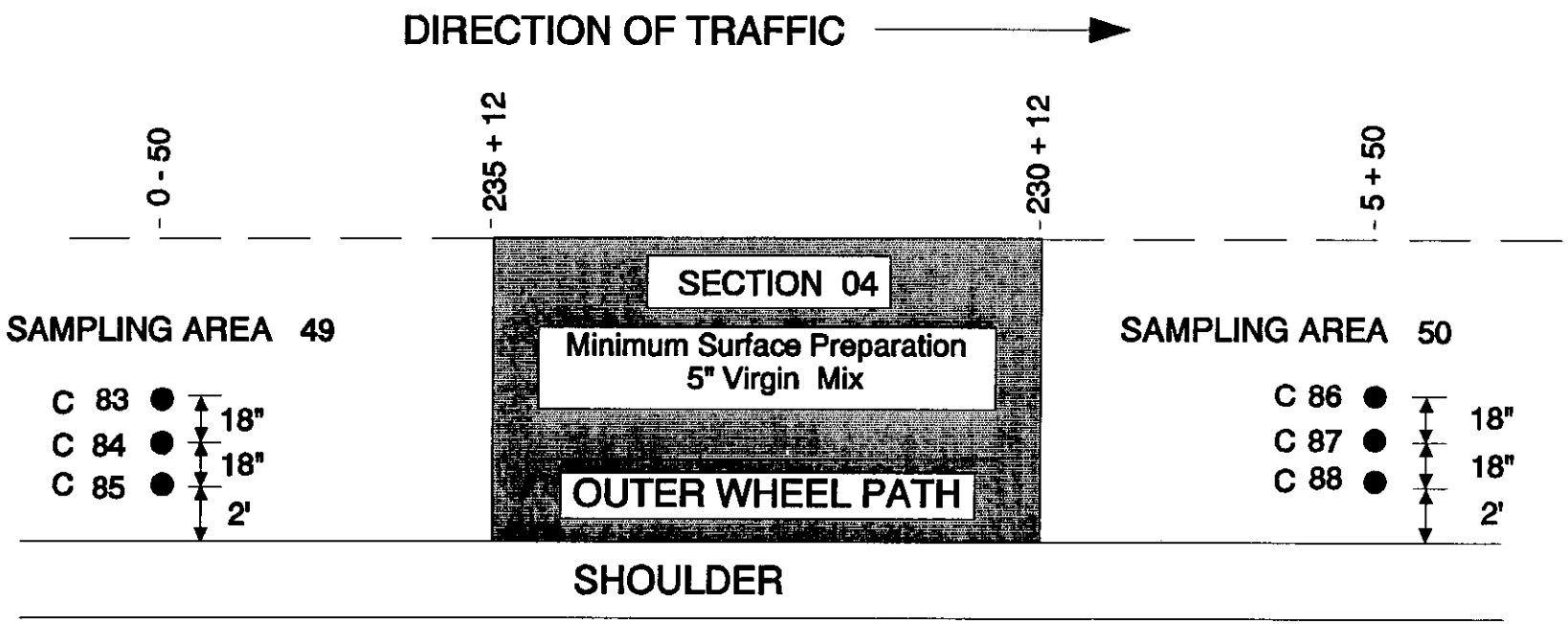


● 4" OD core of AC overlay layers

"Post - Construction" Sampling Plan for Section 66

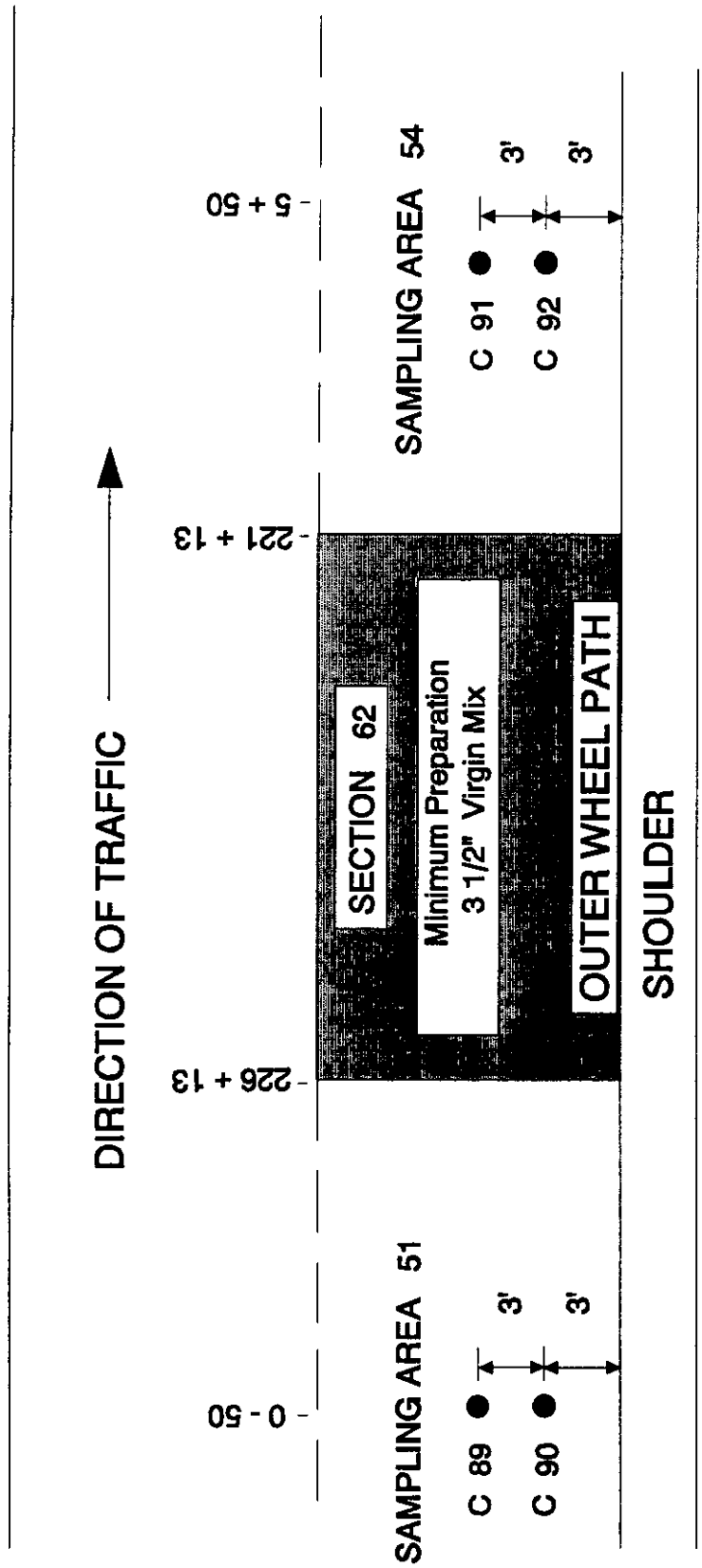


"Post - Construction" Sampling Plan for Section 07



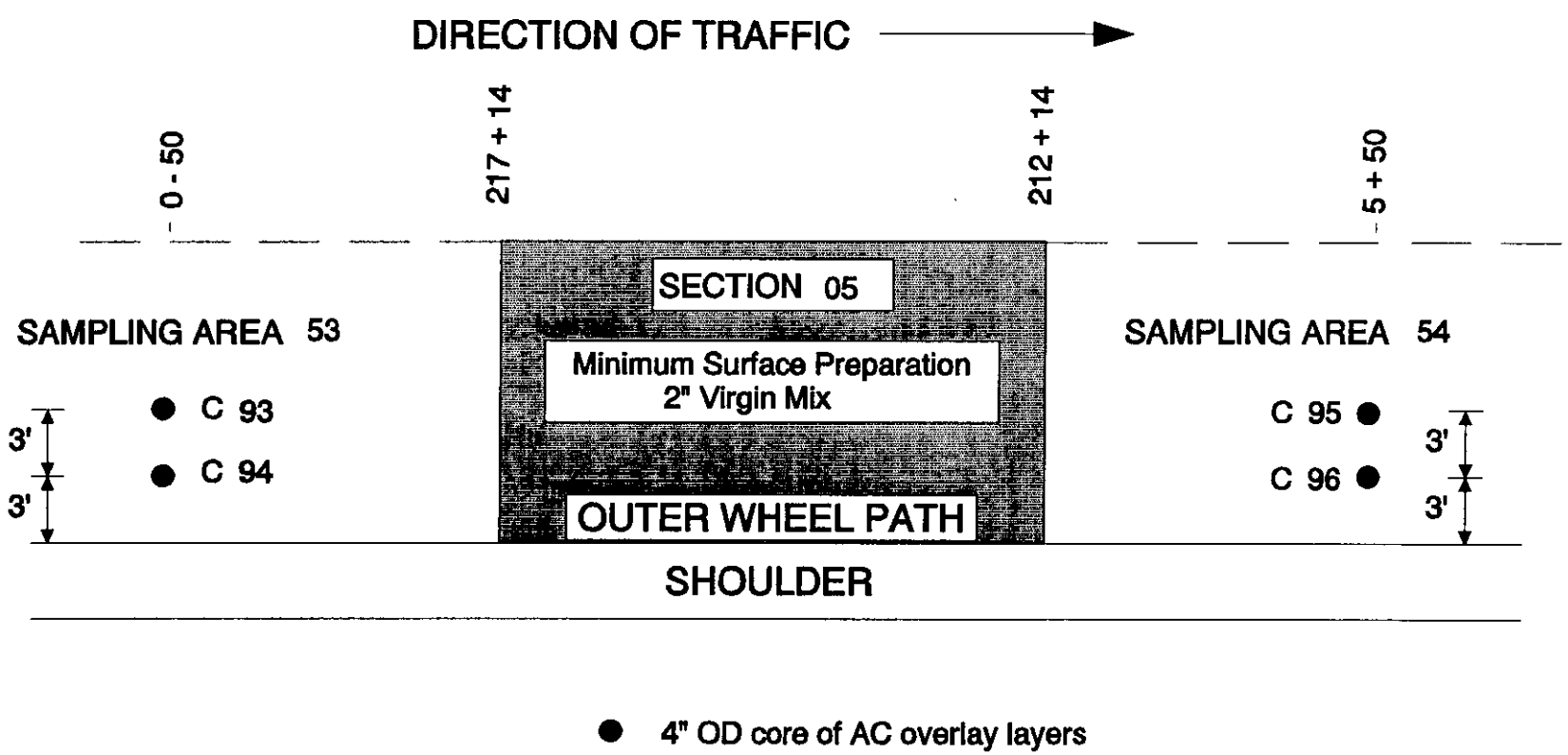
● 4" OD core of AC overlay layers

"Post - Construction" Sampling Plan for Section 04



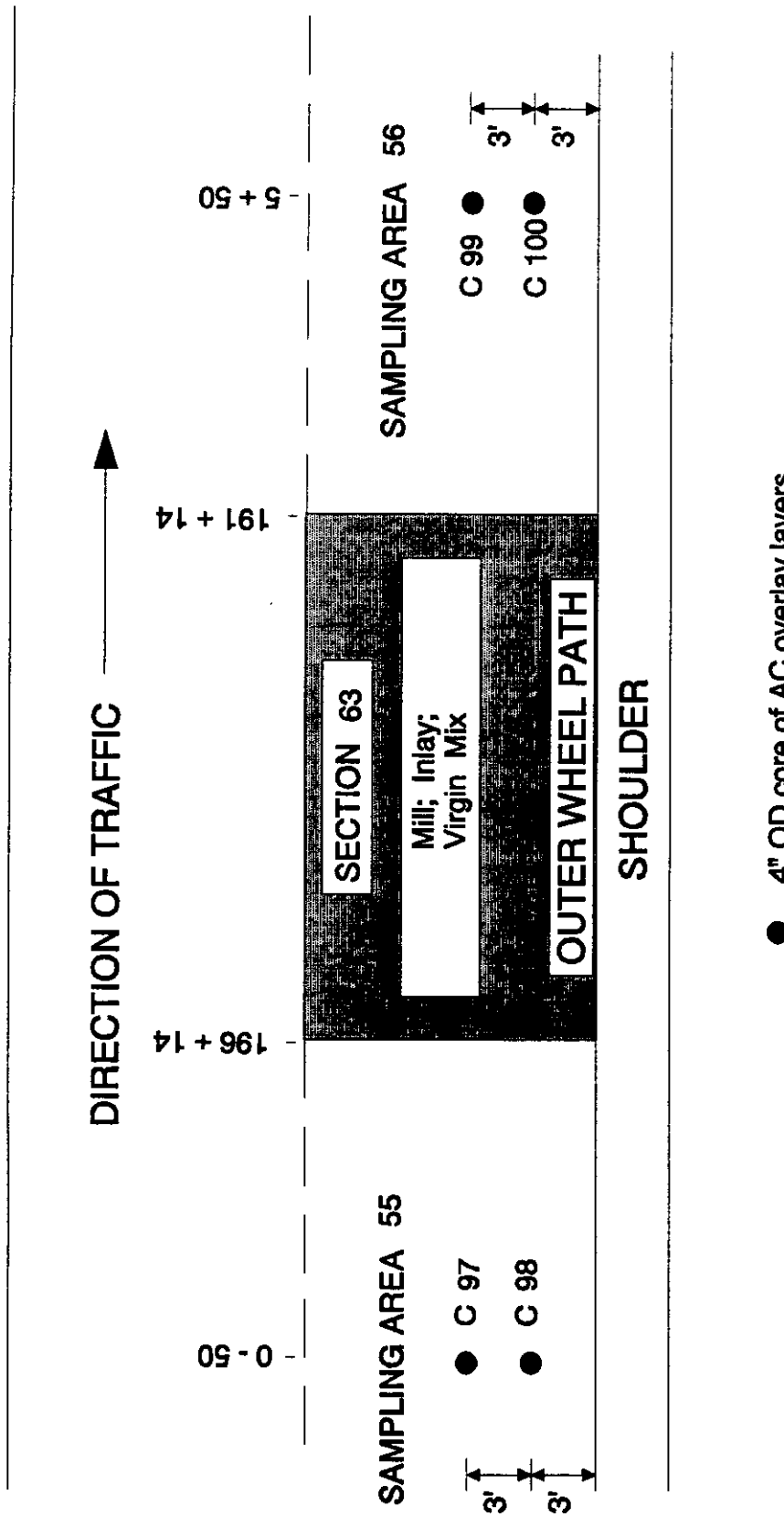
● 4" OD core of AC overlay layers

"Post - Construction" Sampling Plan for Section 62

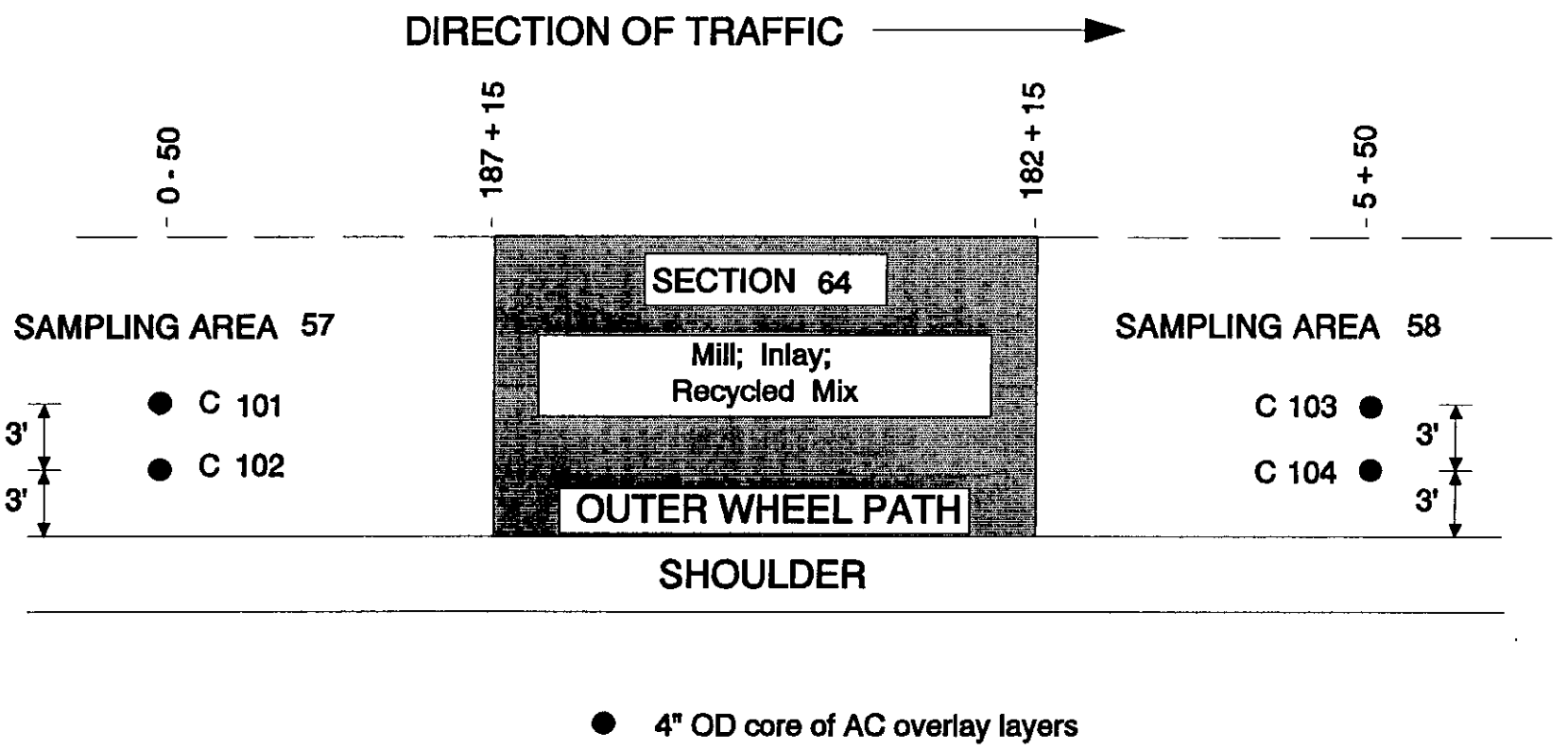


● 4" OD core of AC overlay layers

"Post - Construction" Sampling Plan for Section 05

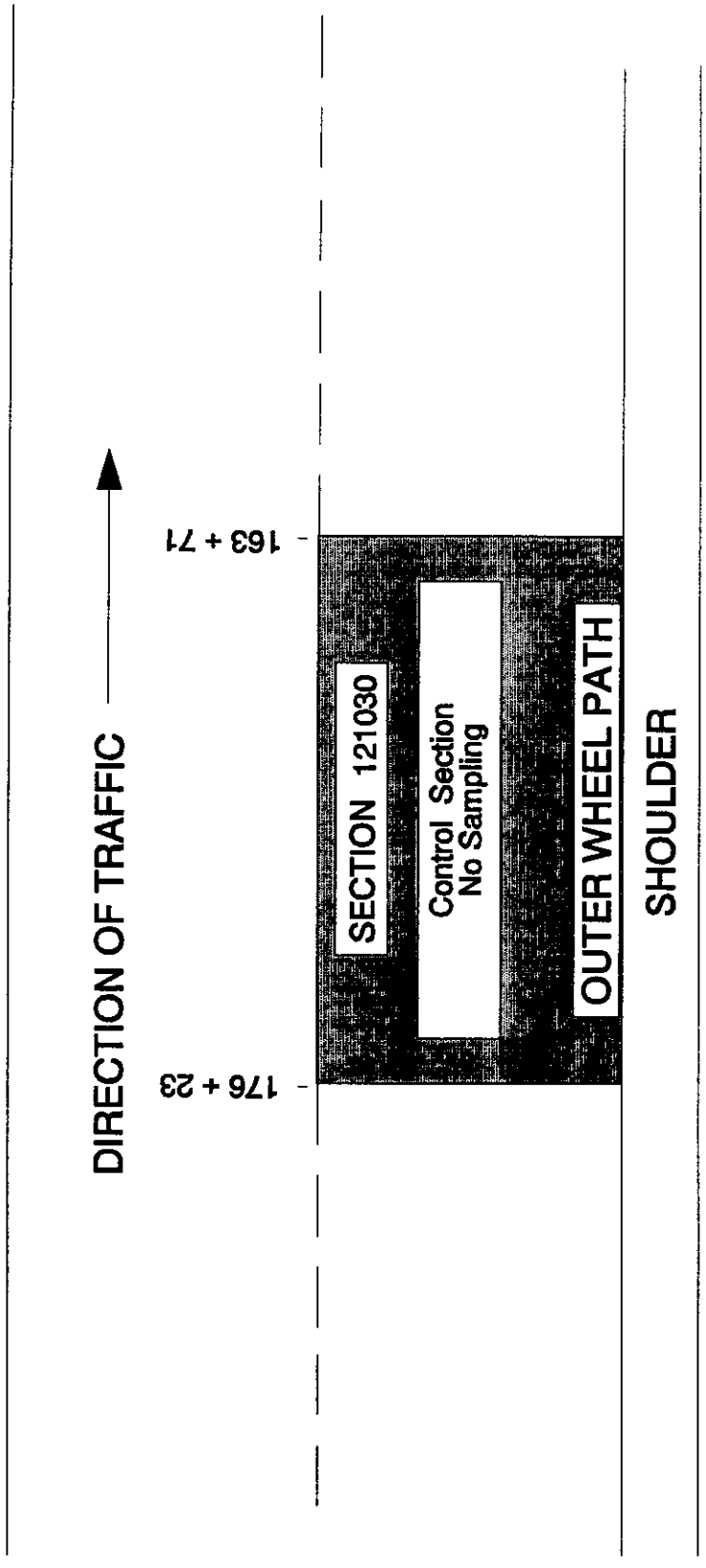


"Post - Construction" Sampling Plan for Section 63



● 4" OD core of AC overlay layers

"Post - Construction" Sampling Plan for Section 64

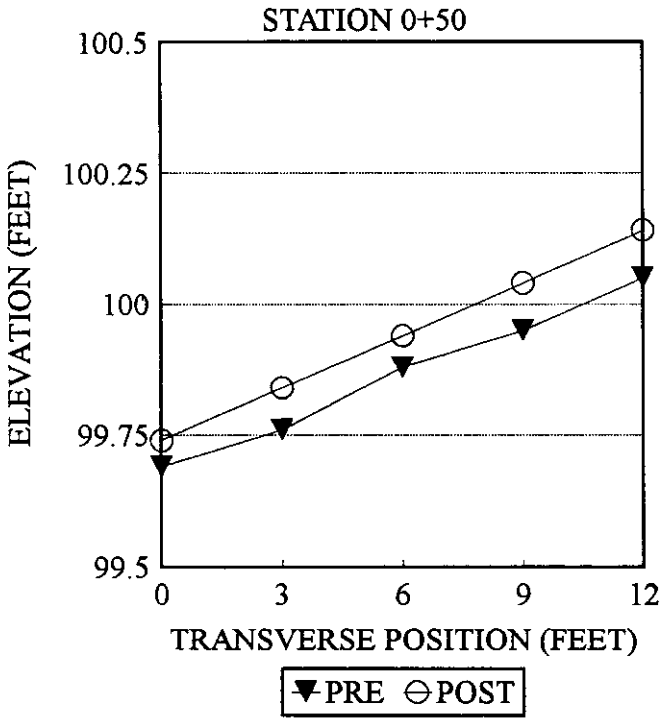


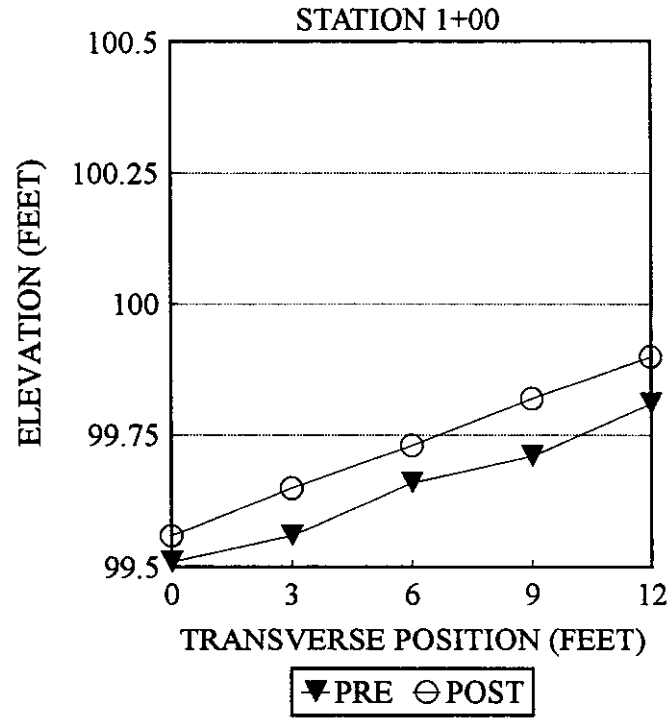
"Post - Construction" Sampling Plan for Section 121030

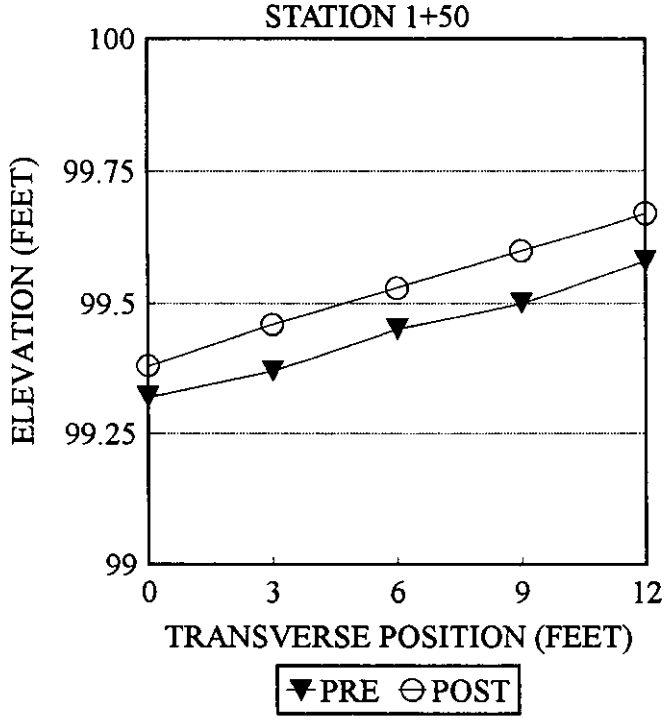
APPENDIX D

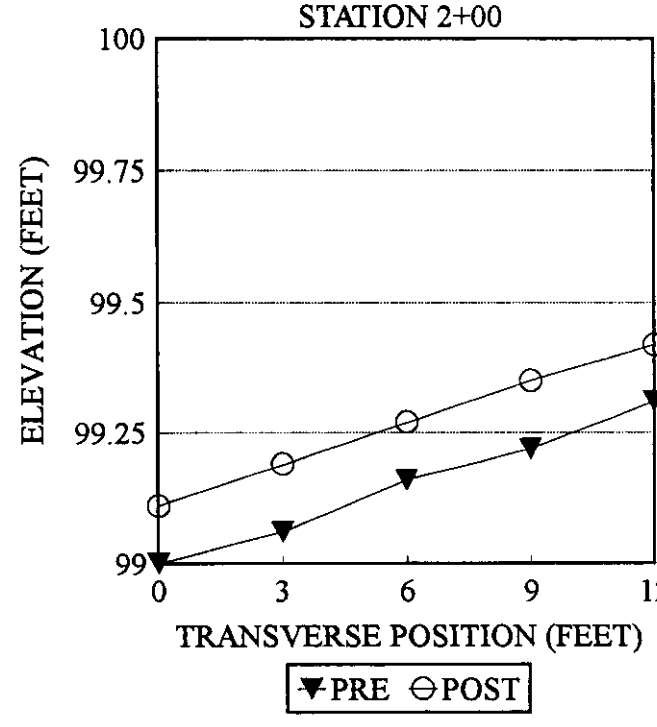
ROD AND LEVEL TRANSVERSE PROFILE PLOTS

SECTION 120502

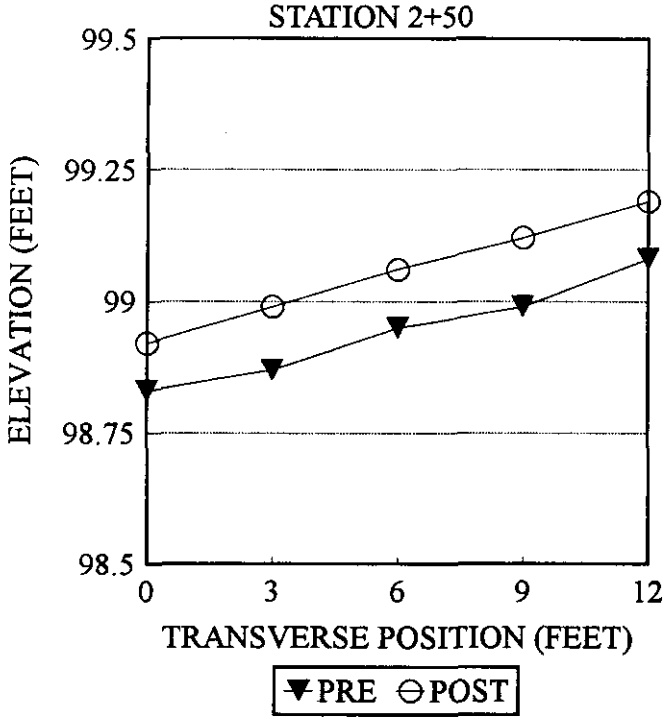


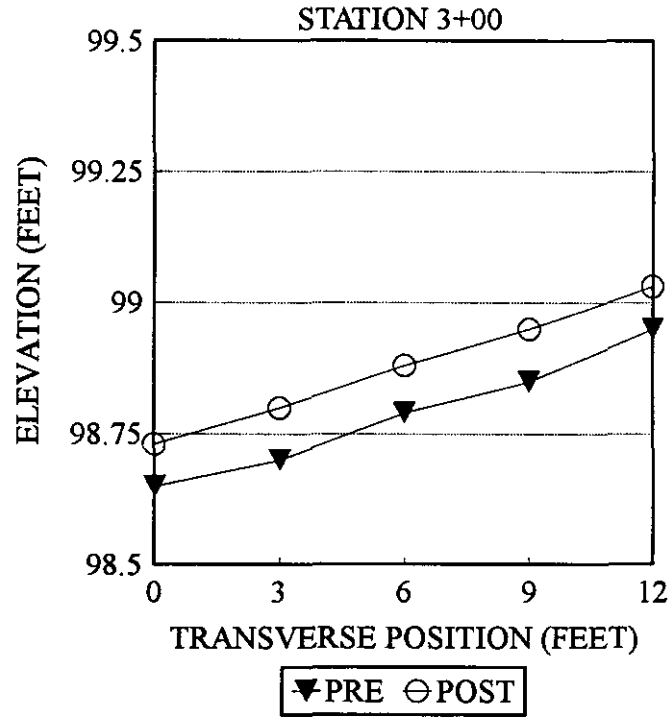


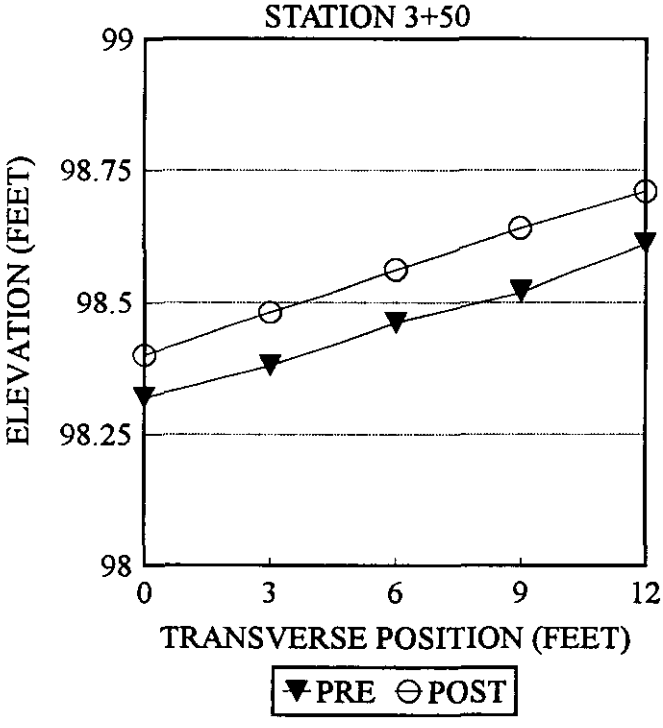


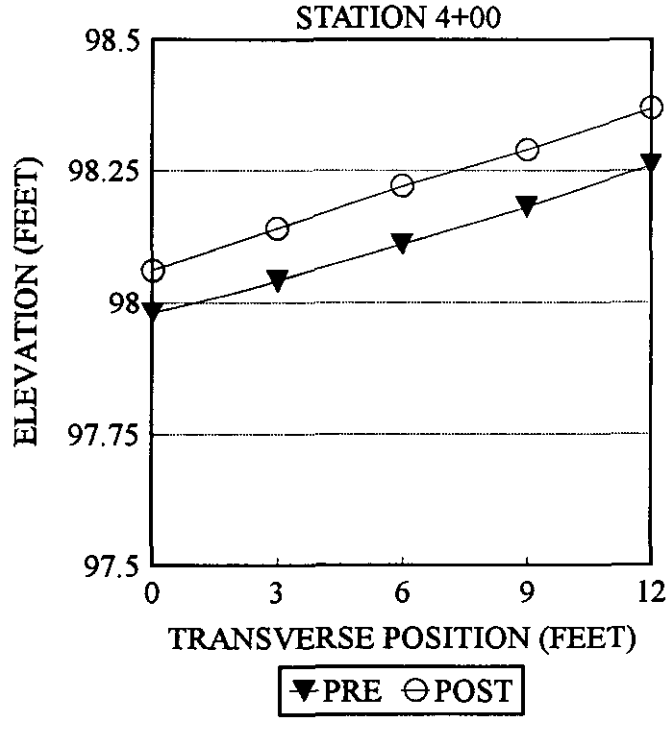


SECTION 120502

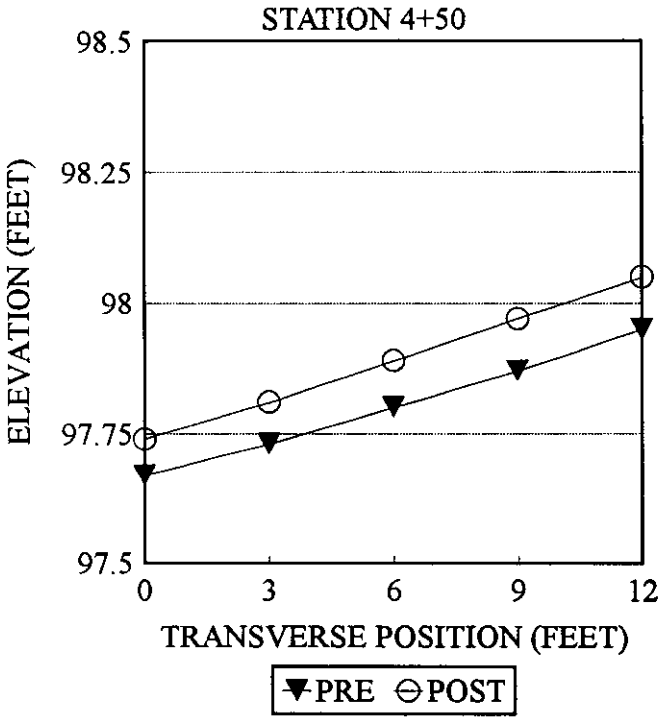


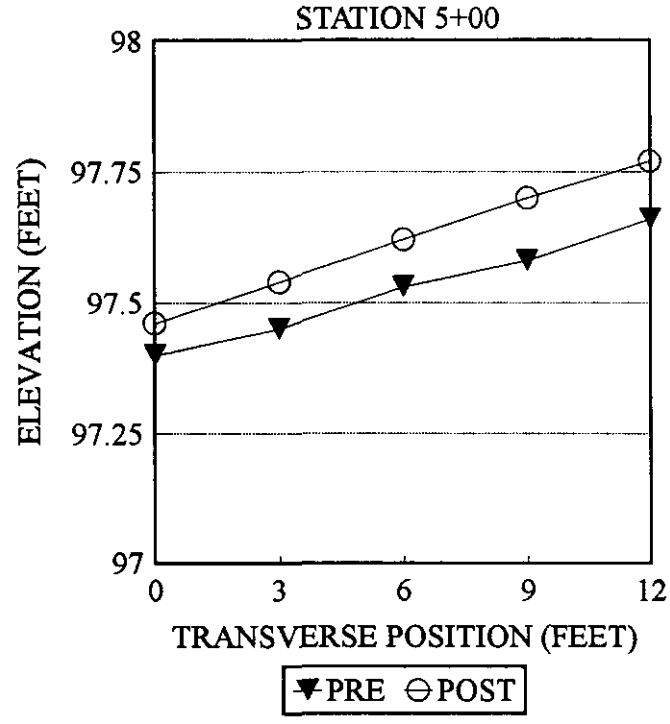




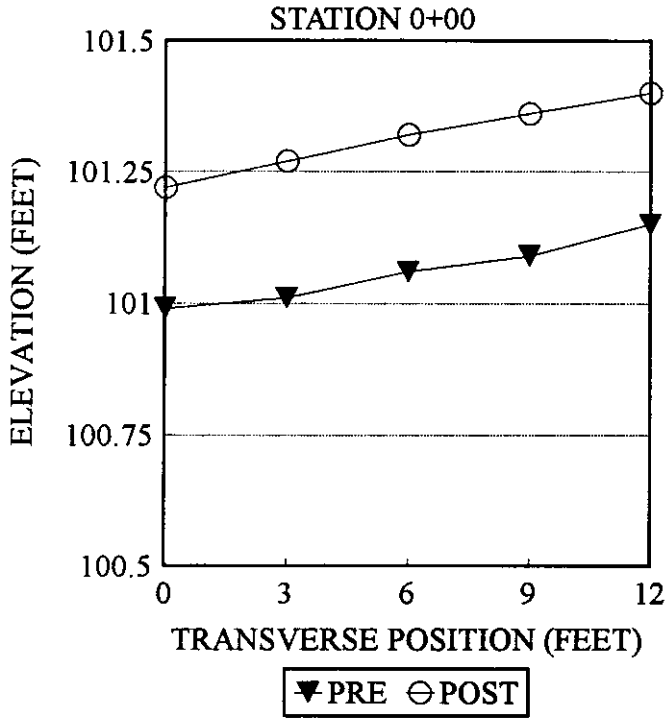


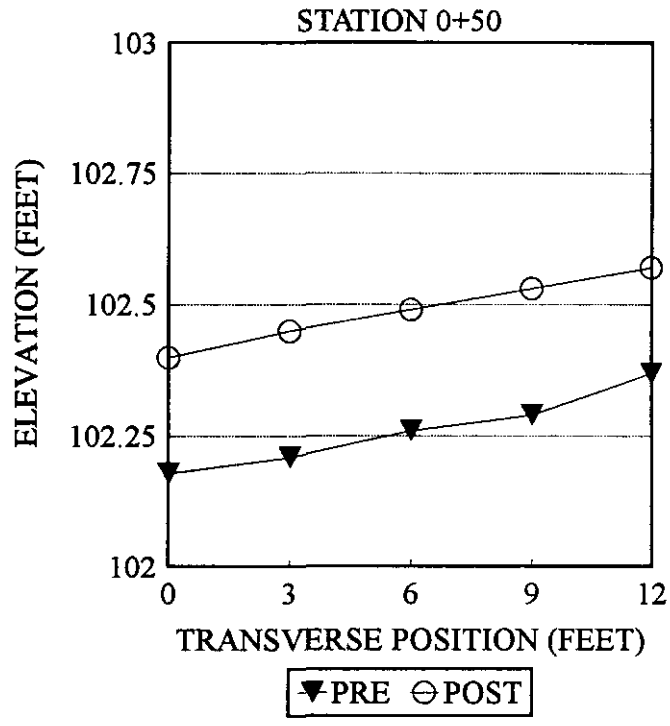
SECTION 120502

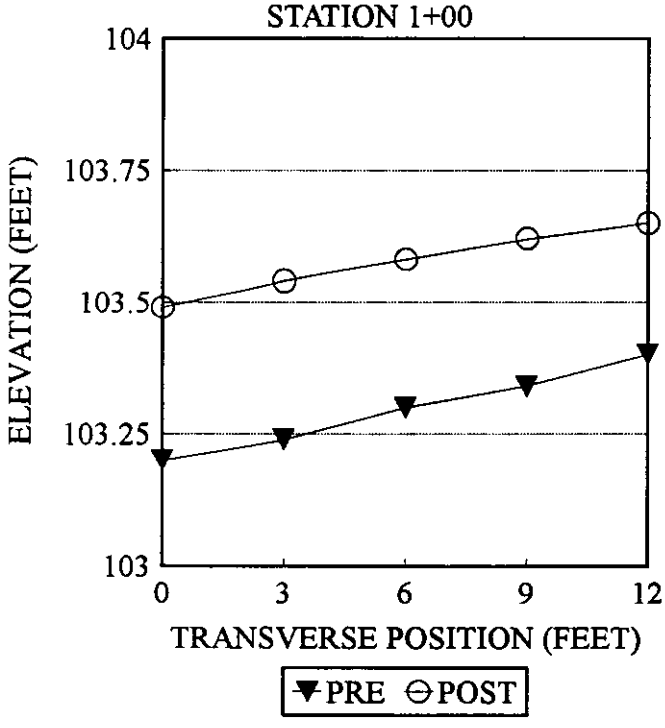


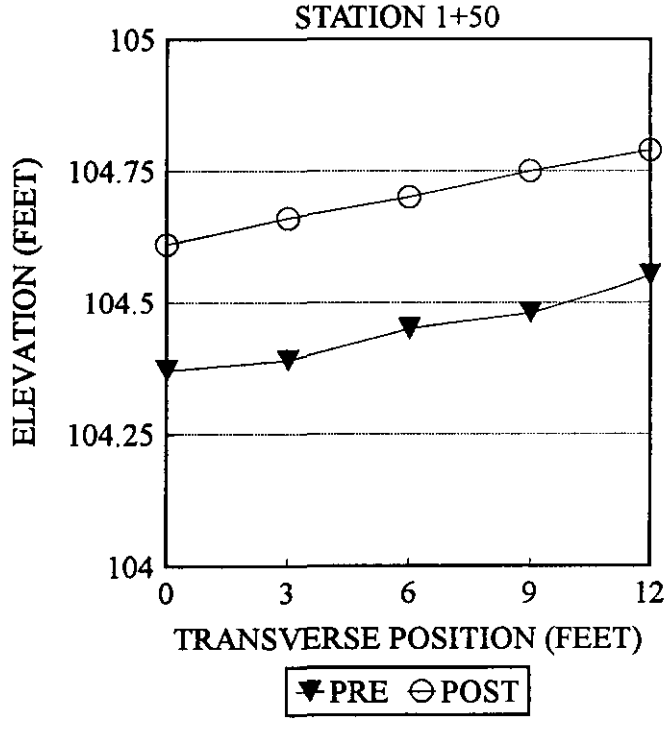


SECTION 120561

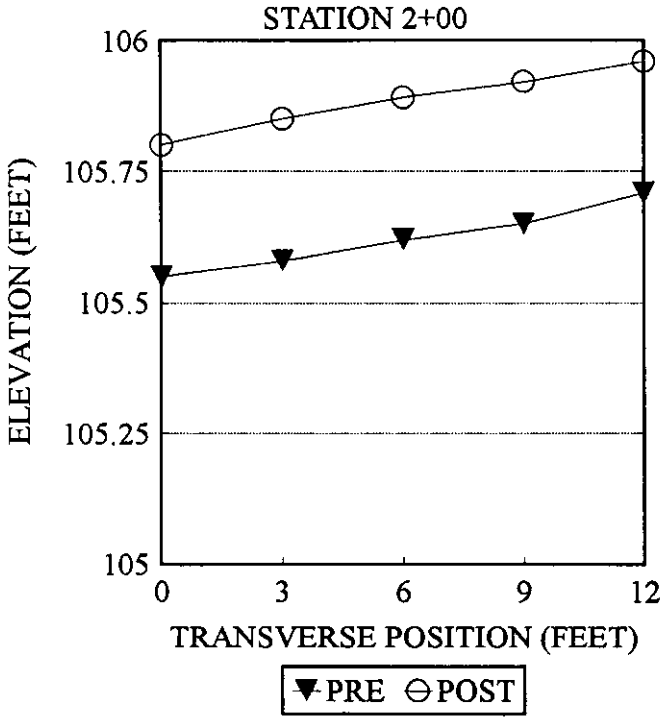


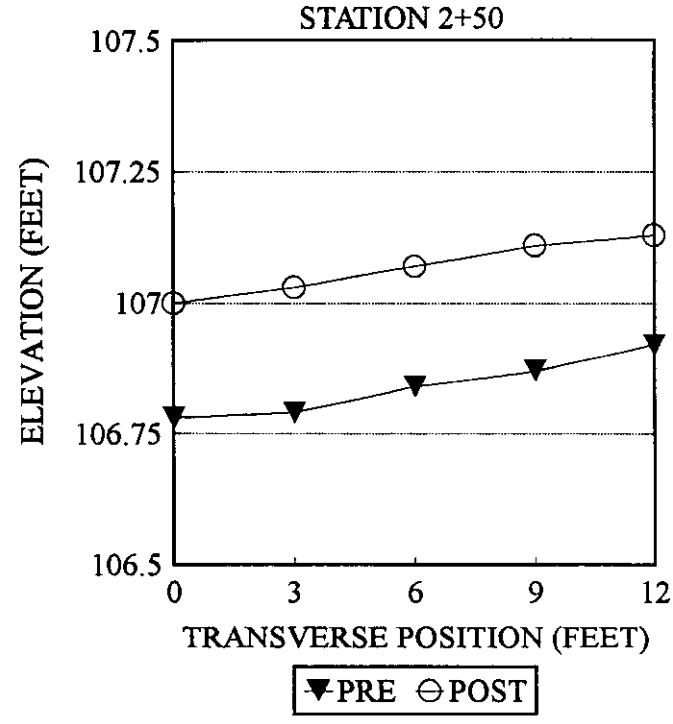


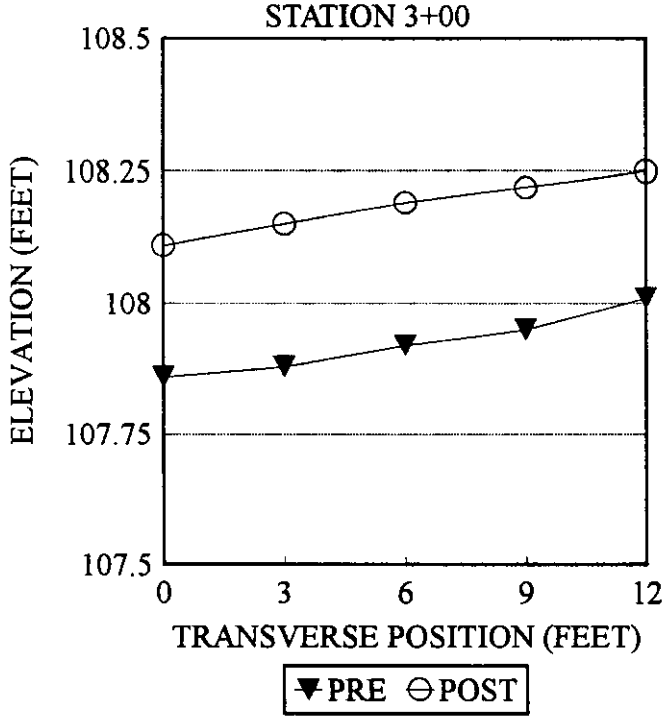


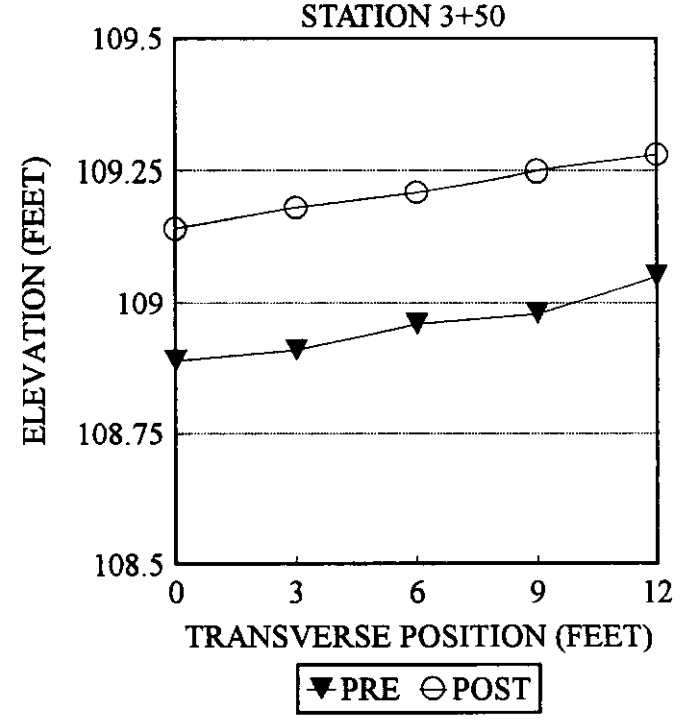


SECTION 120561

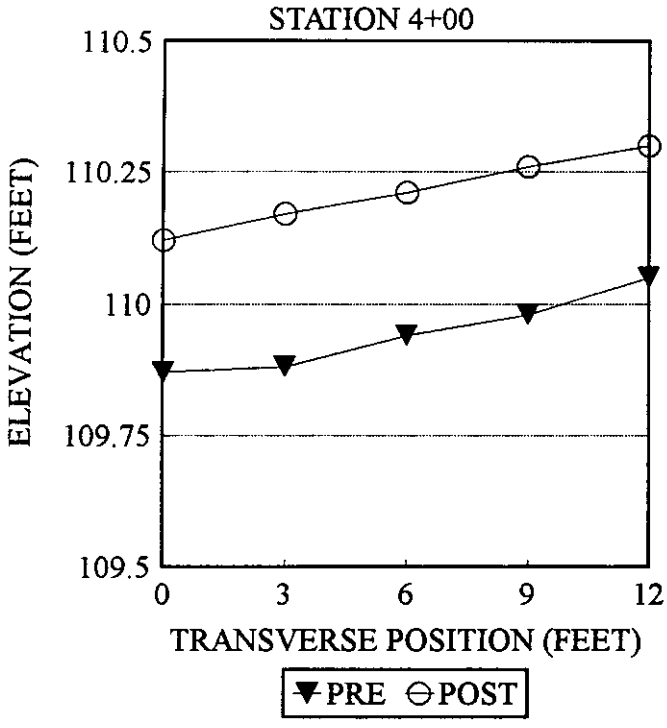


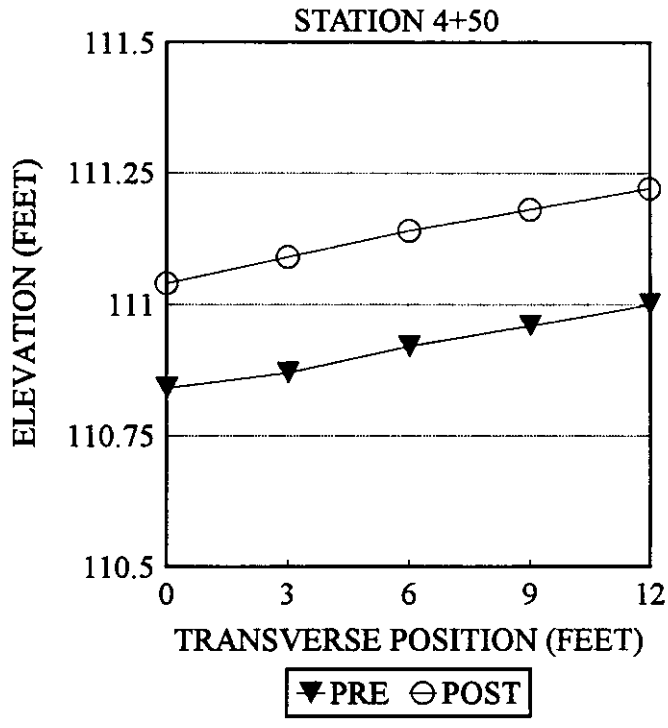


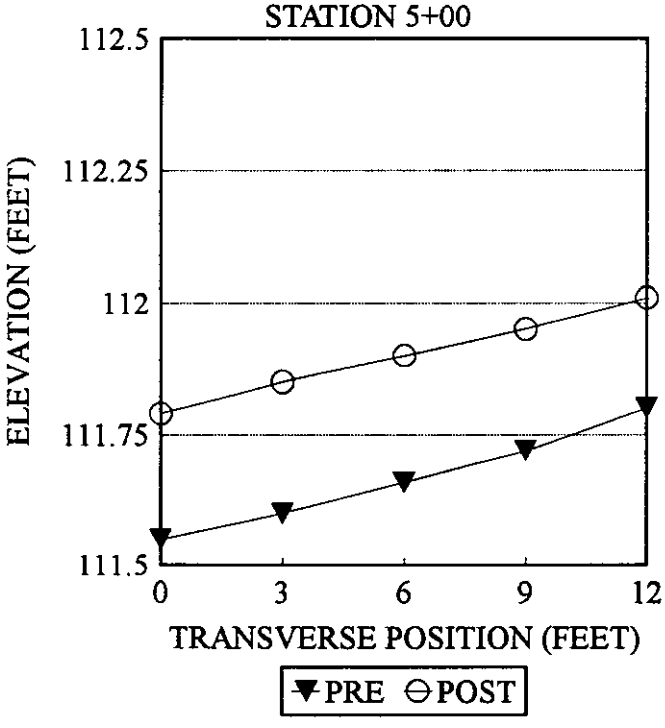




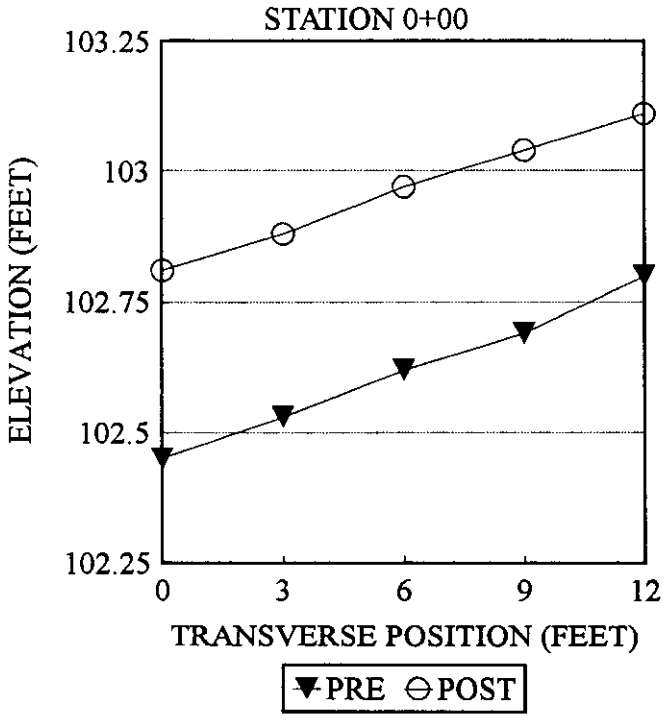
SECTION 120561

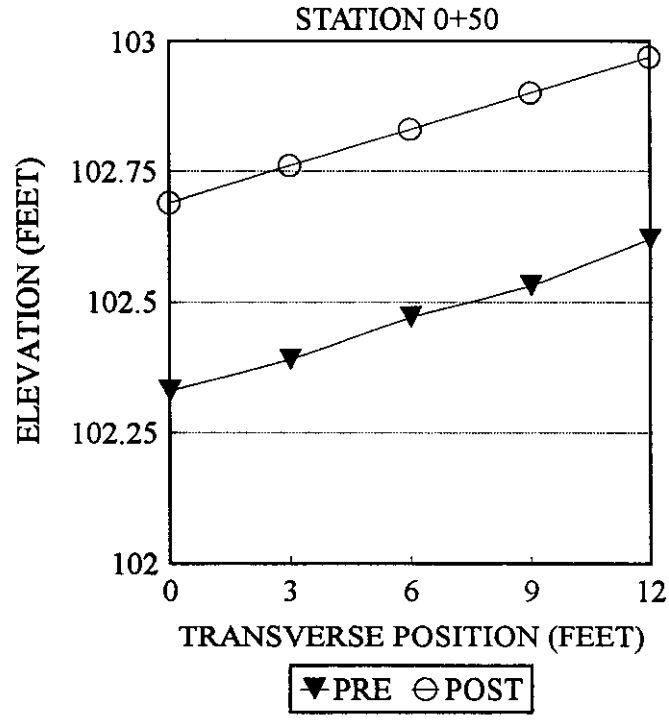


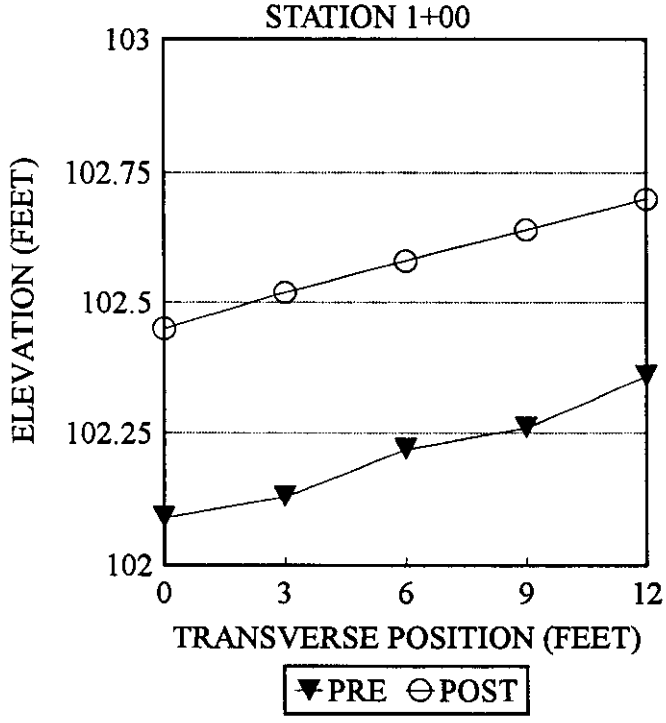


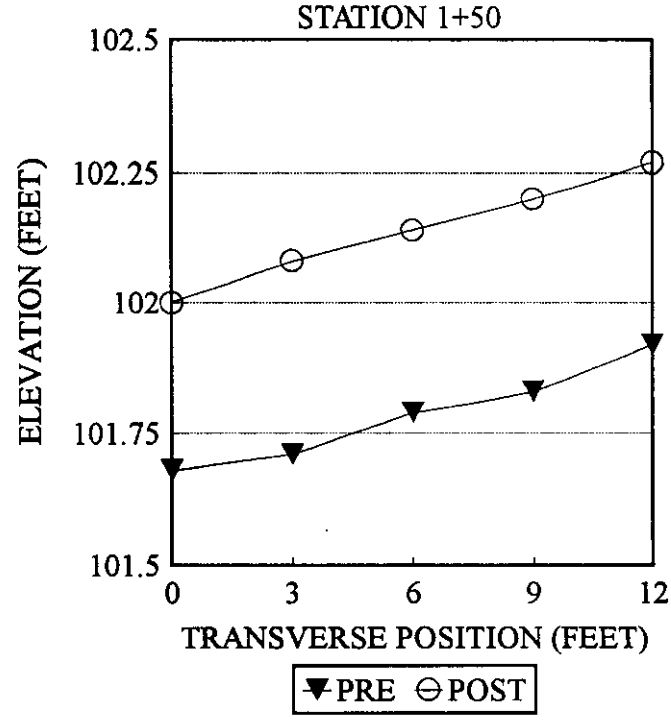


SECTION 120503

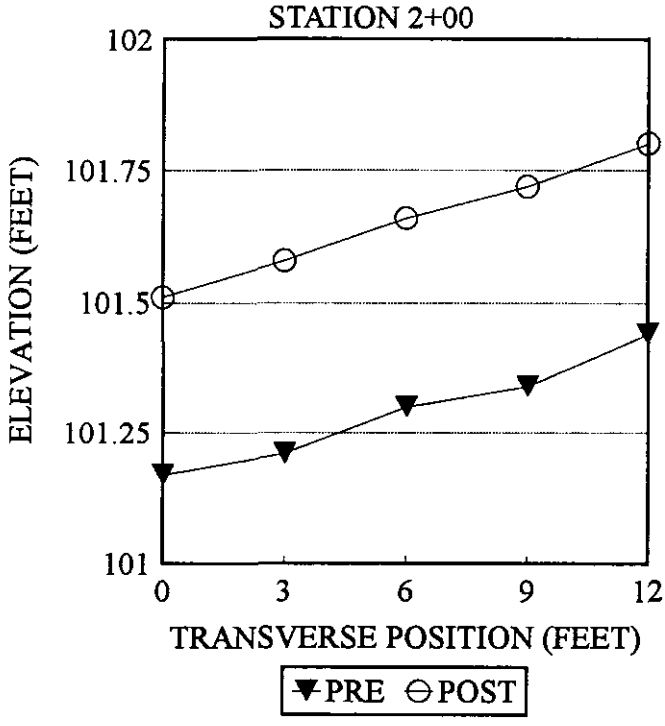


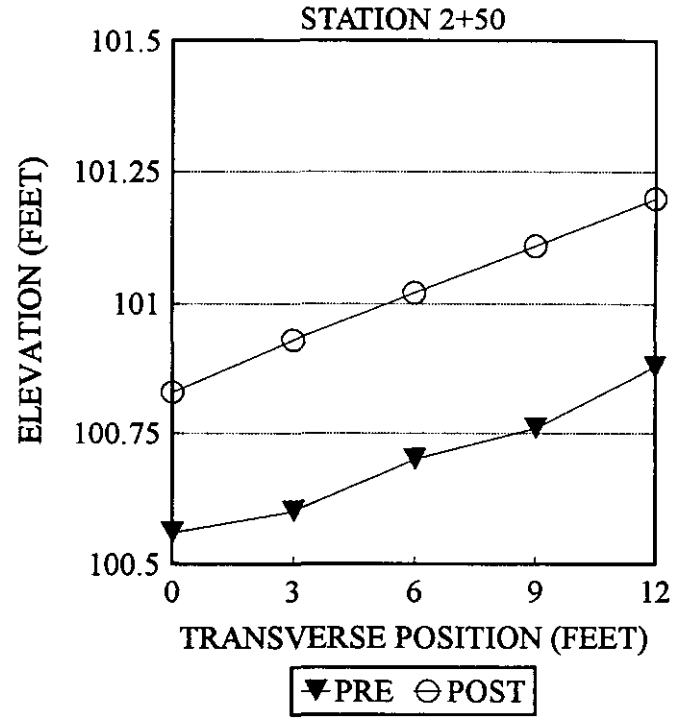


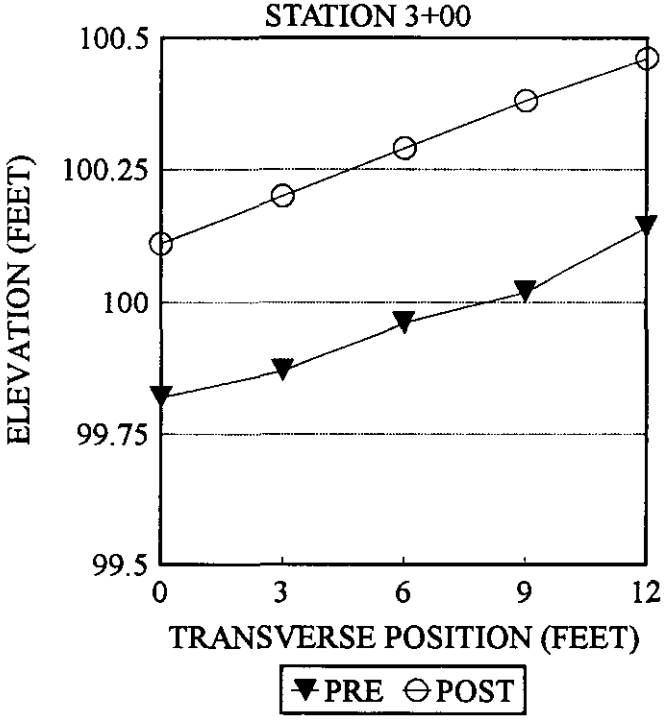


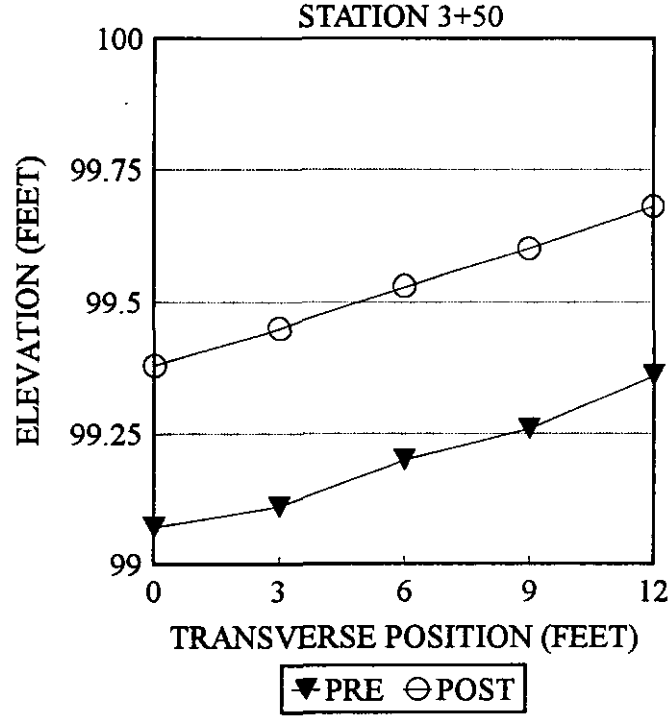


SECTION 120503









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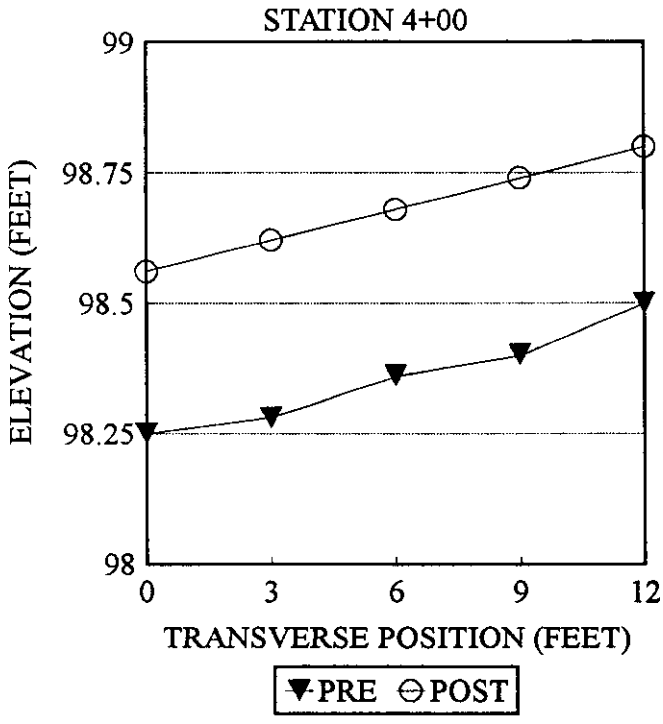

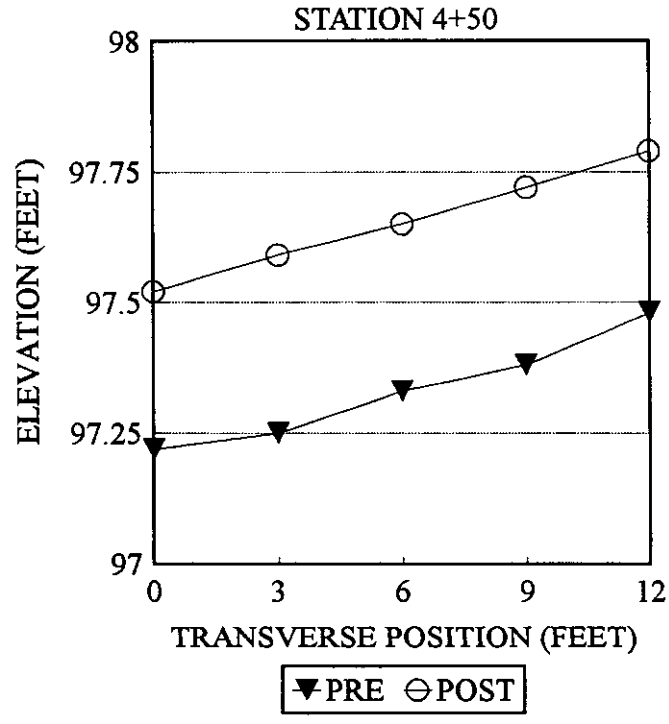

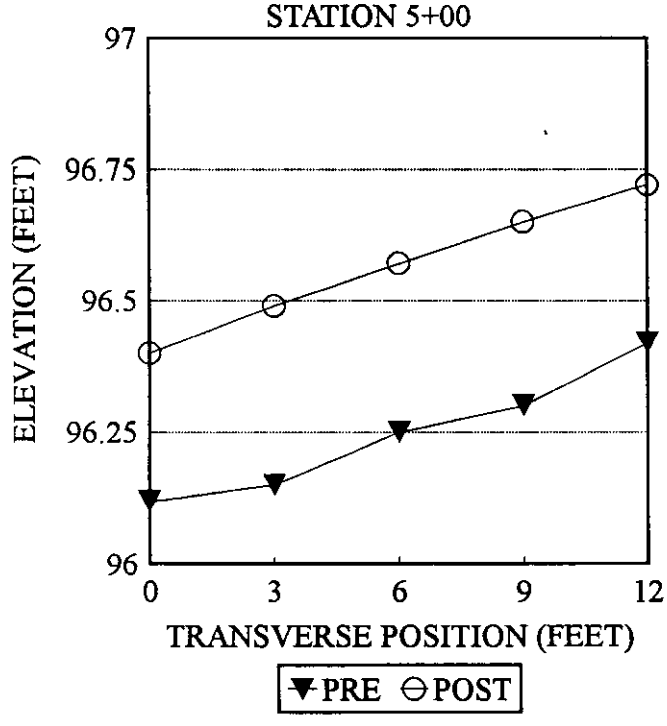

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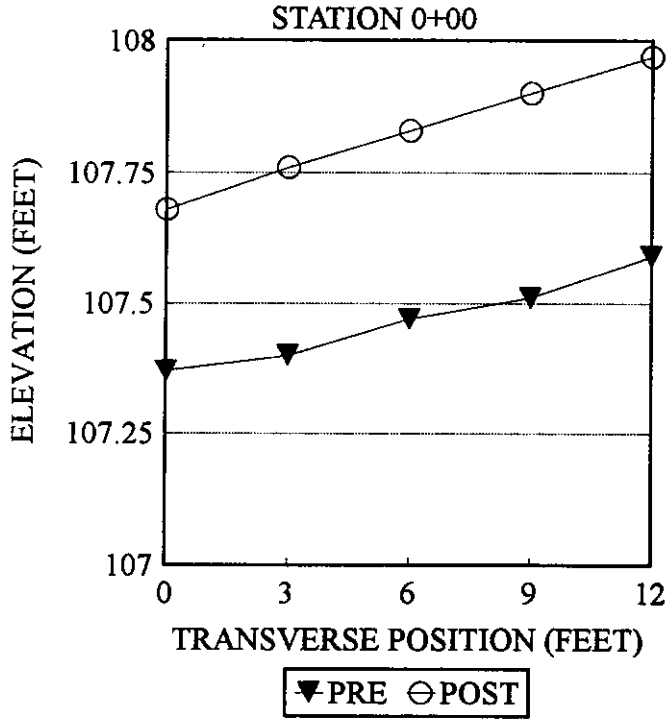

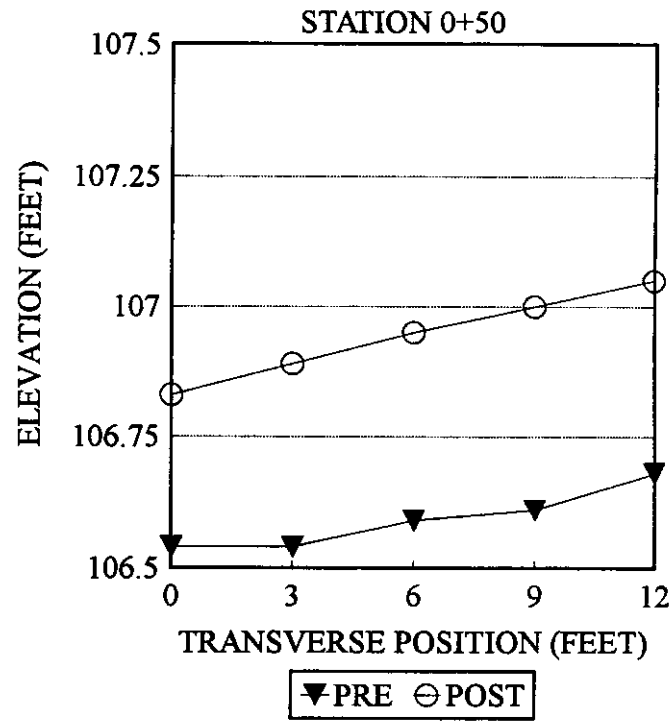

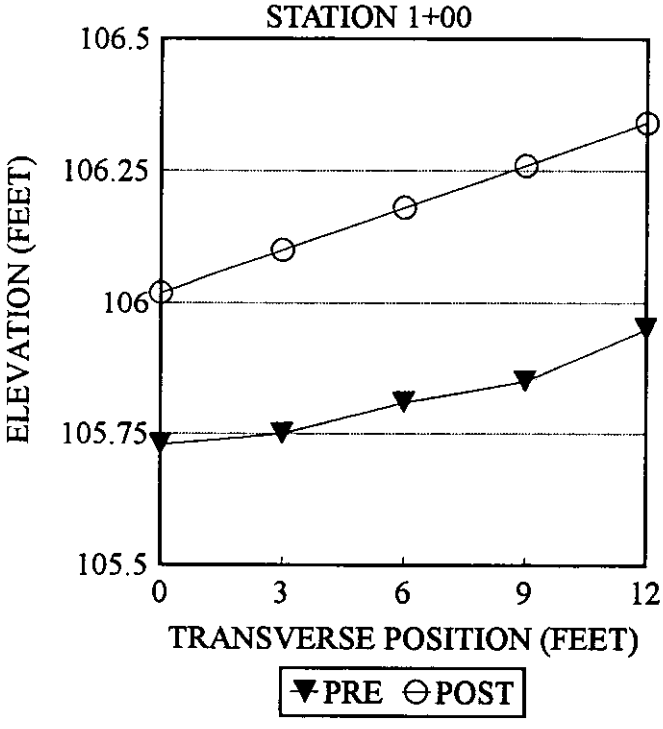

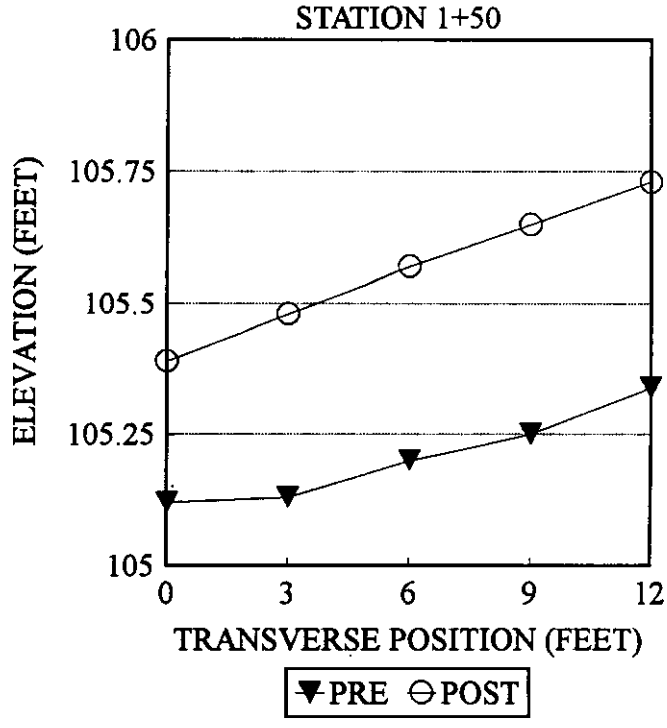

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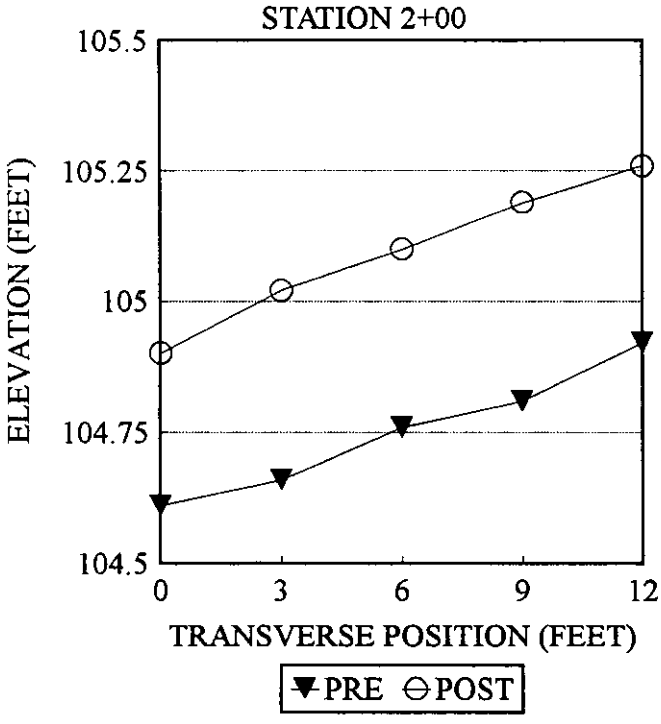

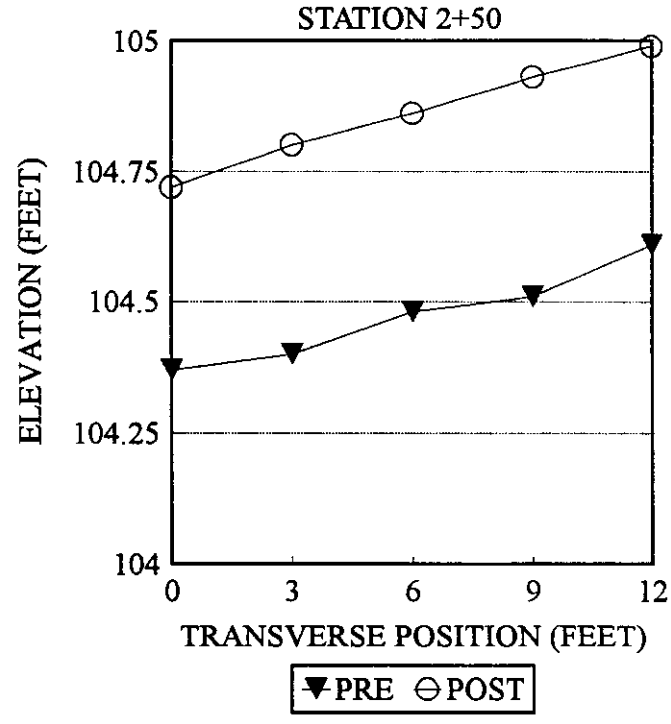

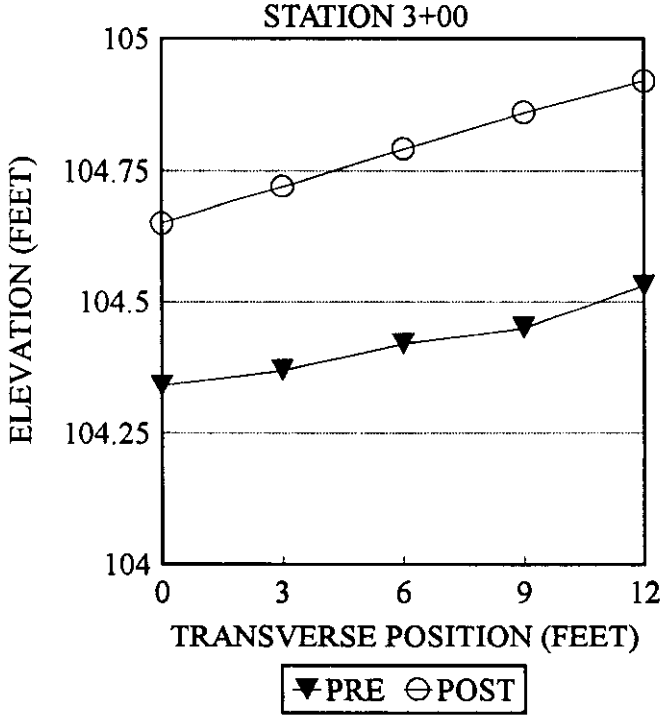

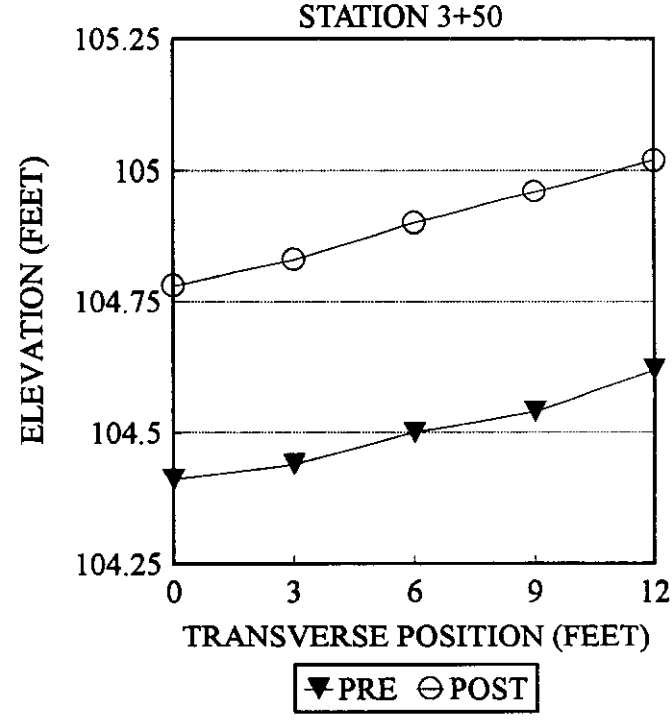

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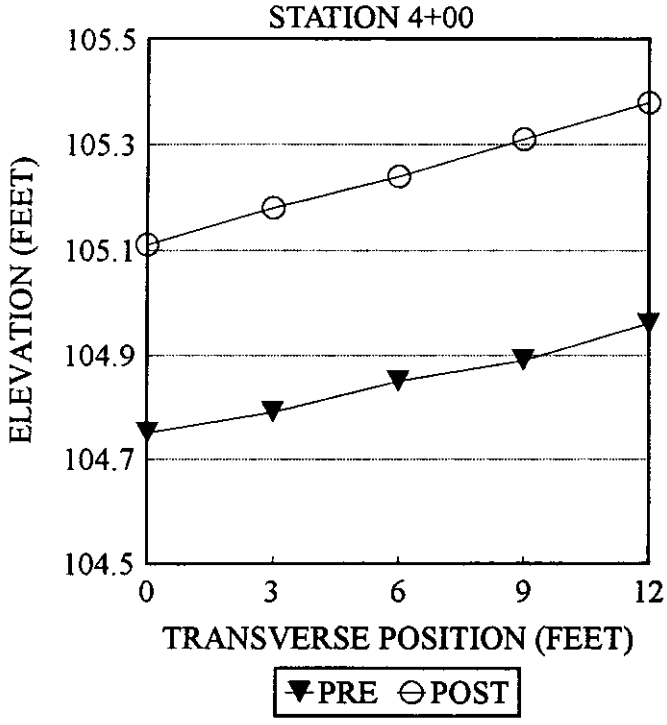

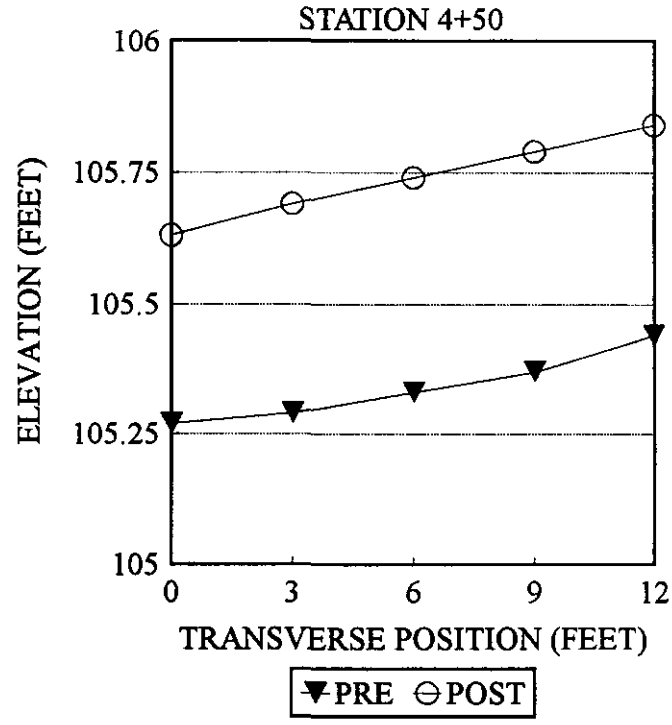

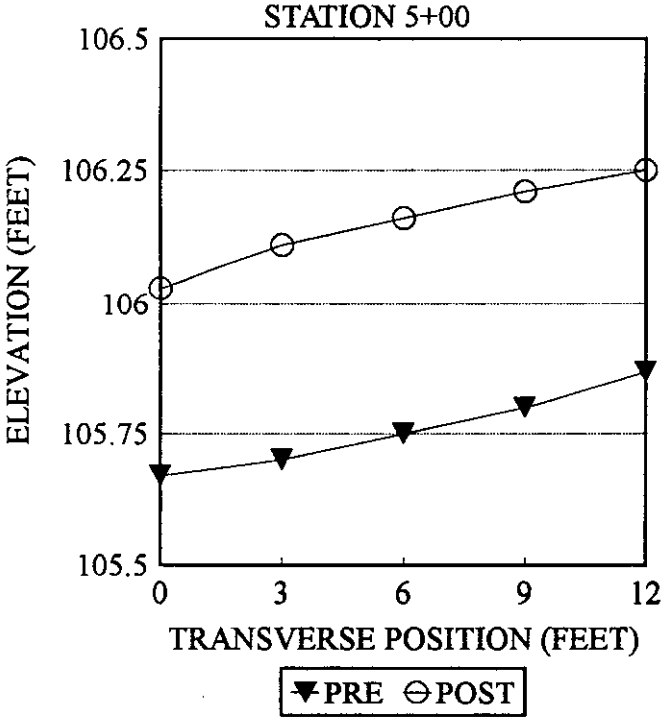

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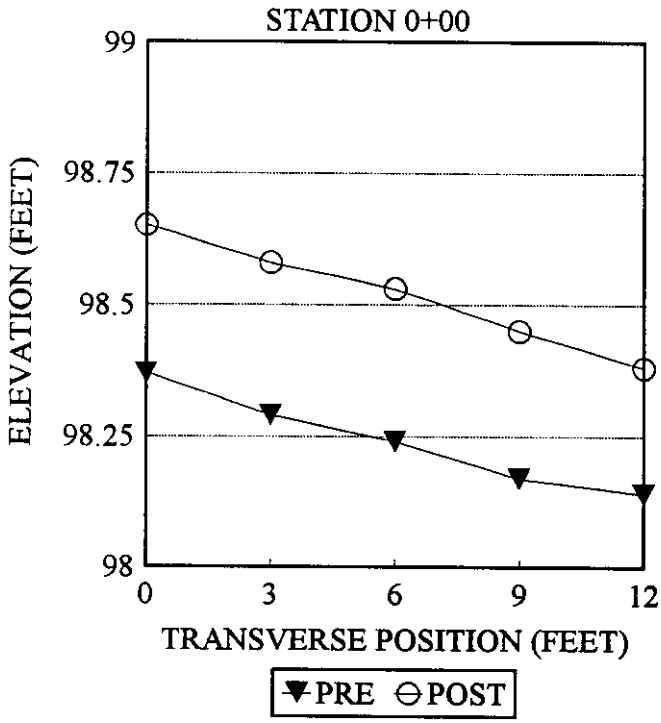

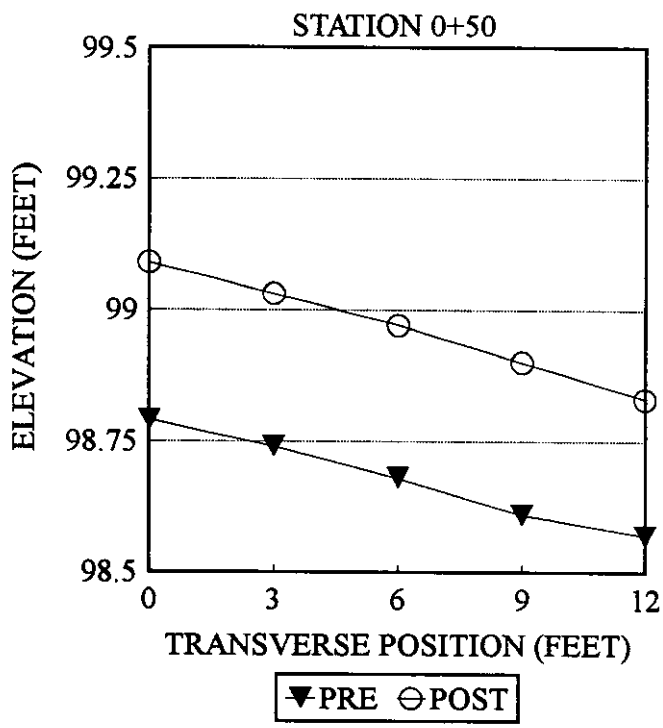

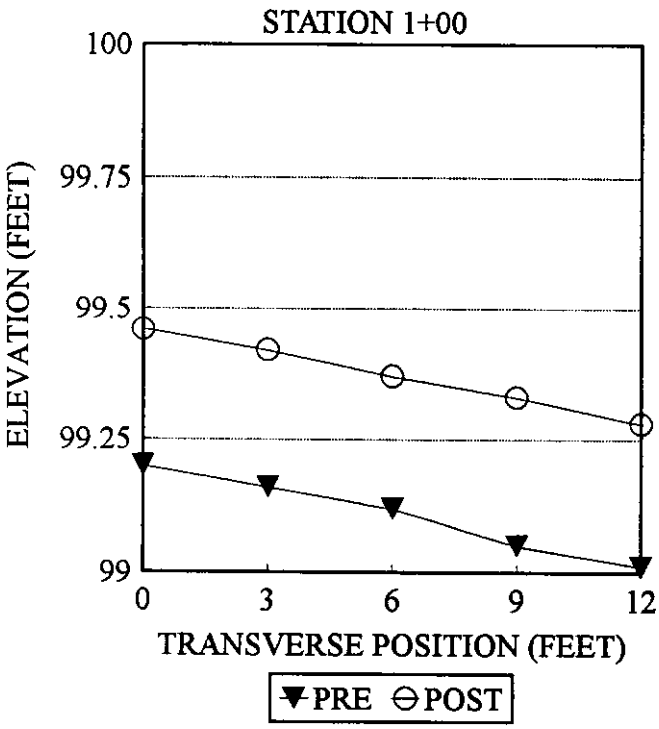

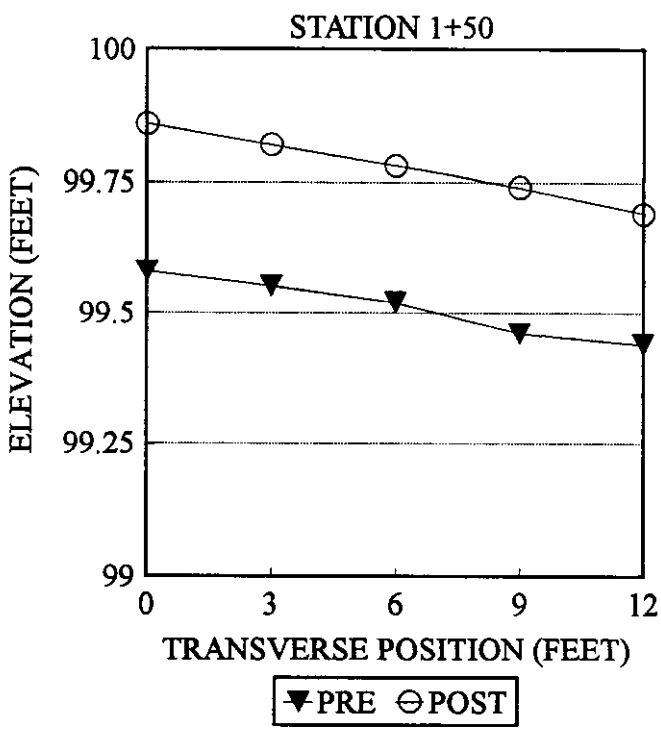

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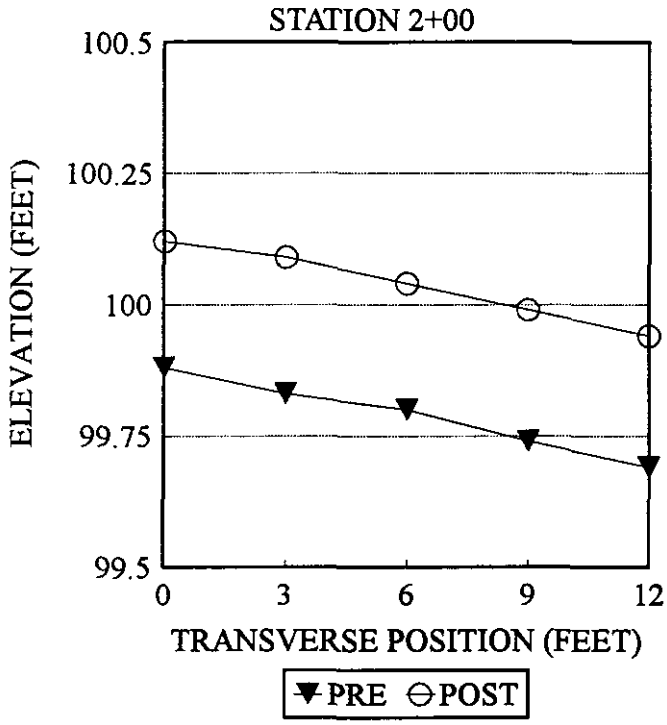

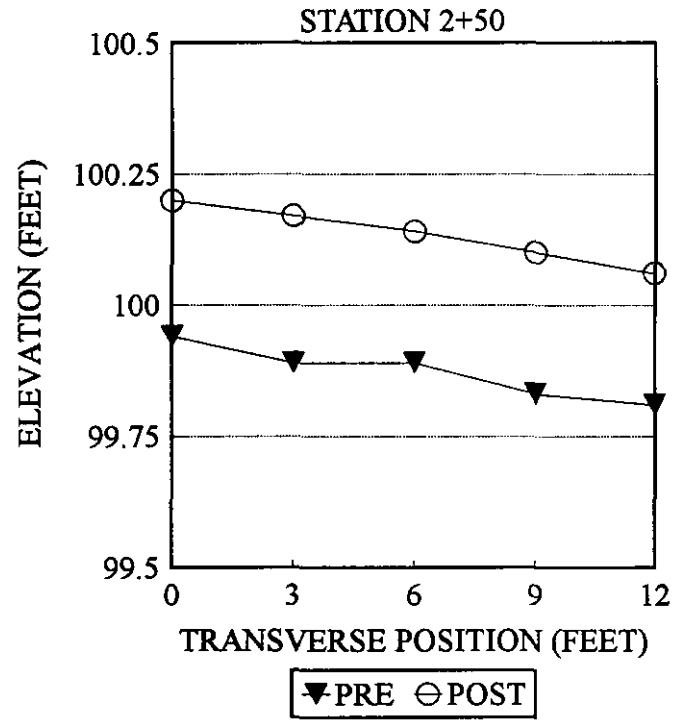

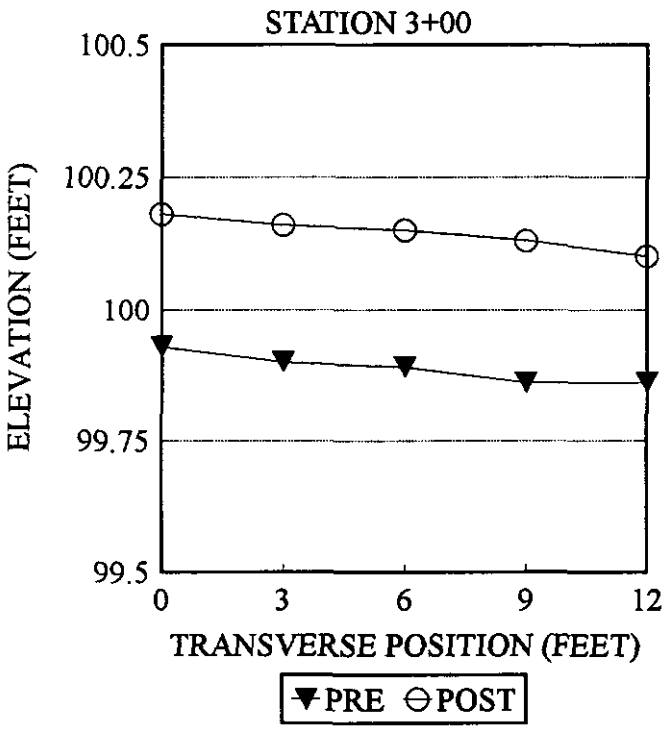

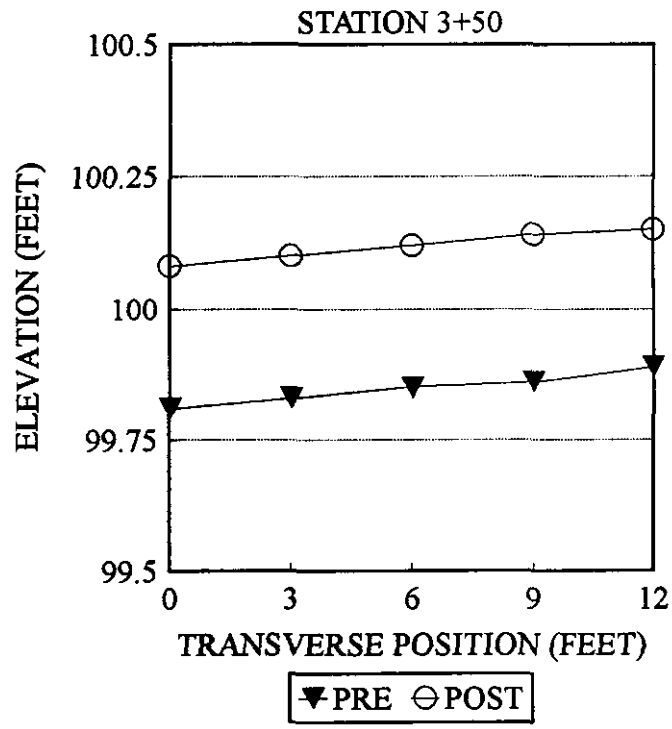

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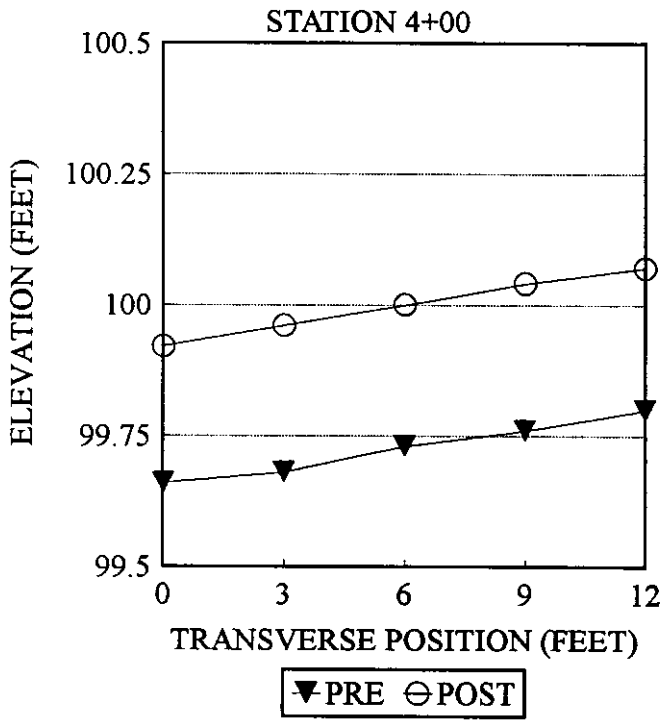

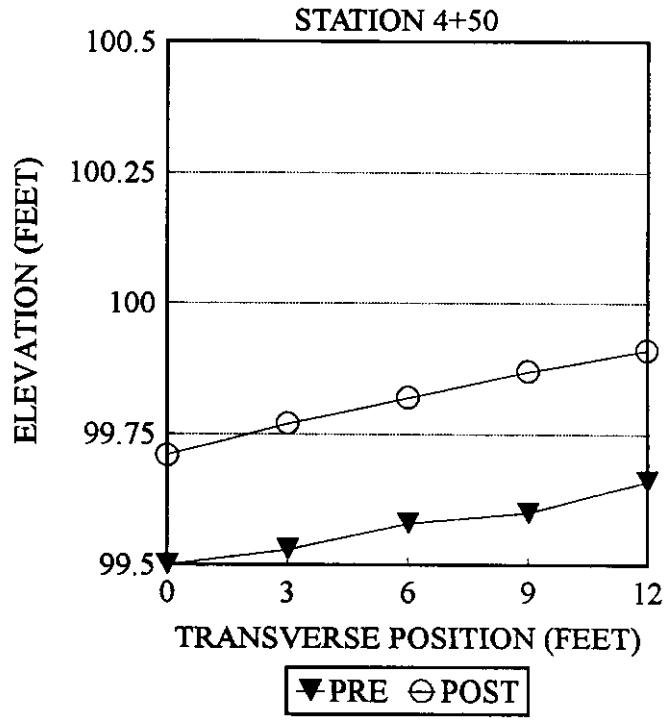

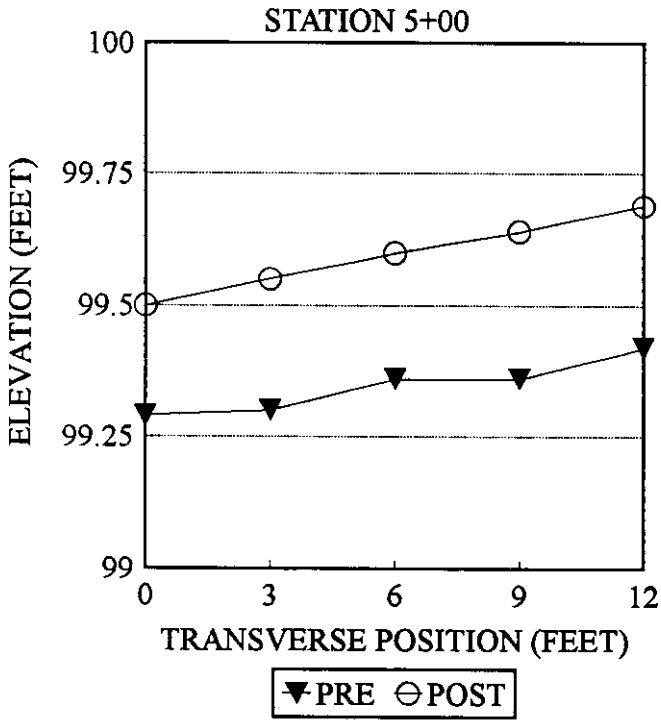

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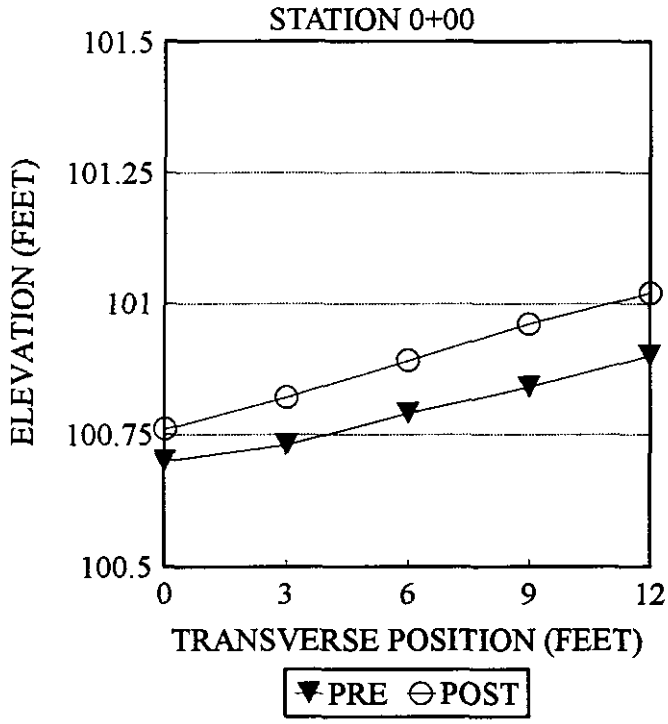

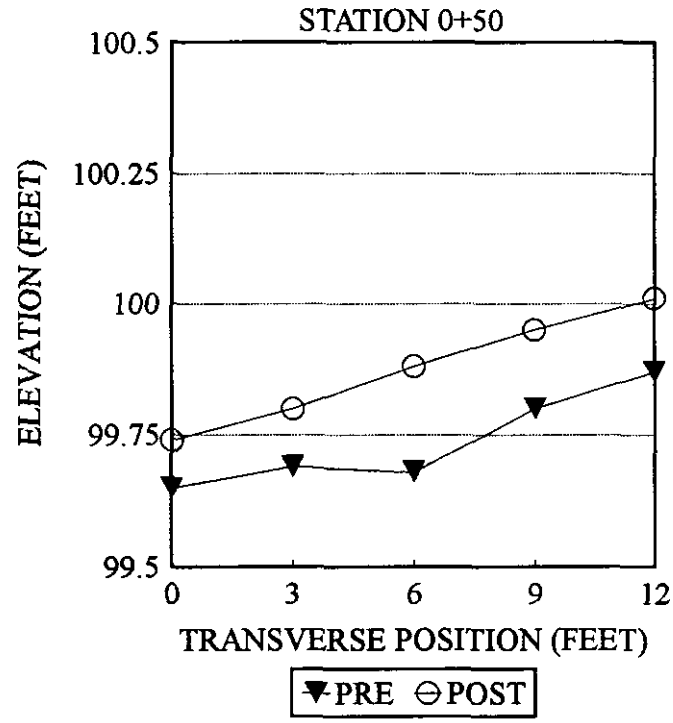

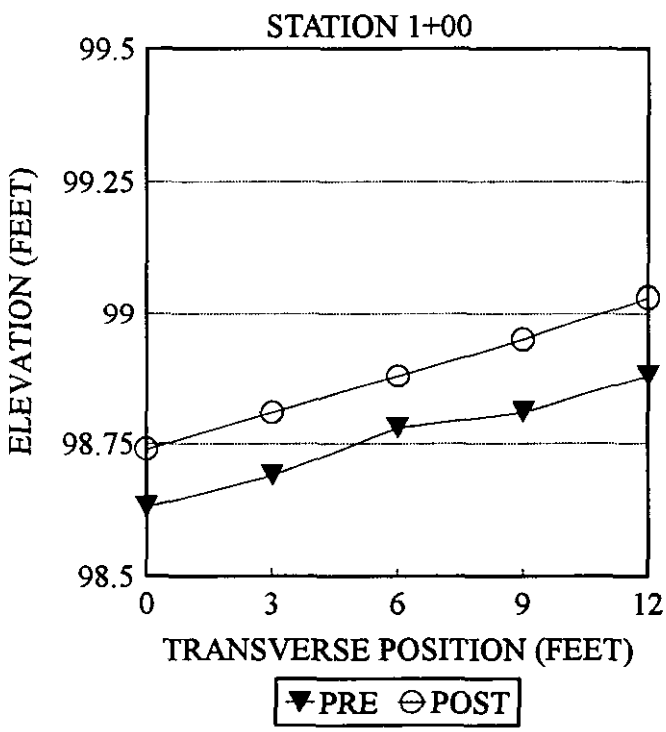

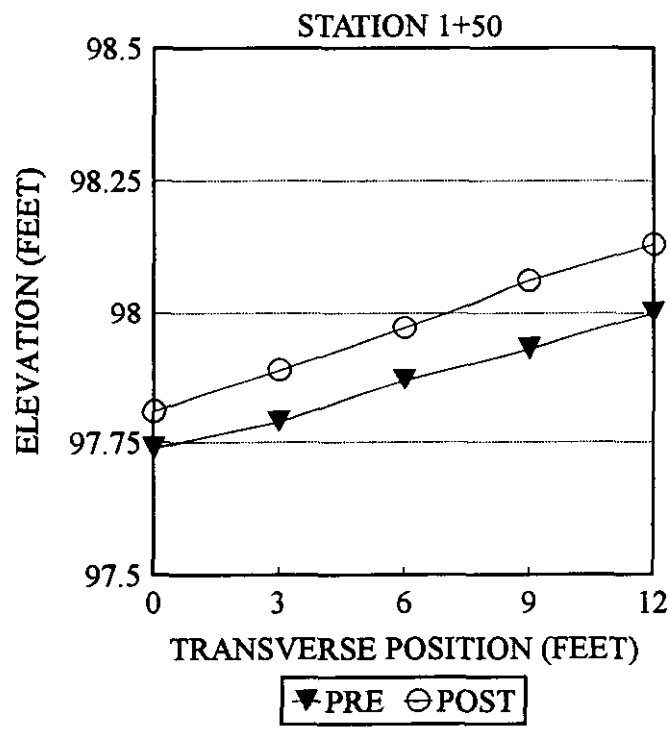

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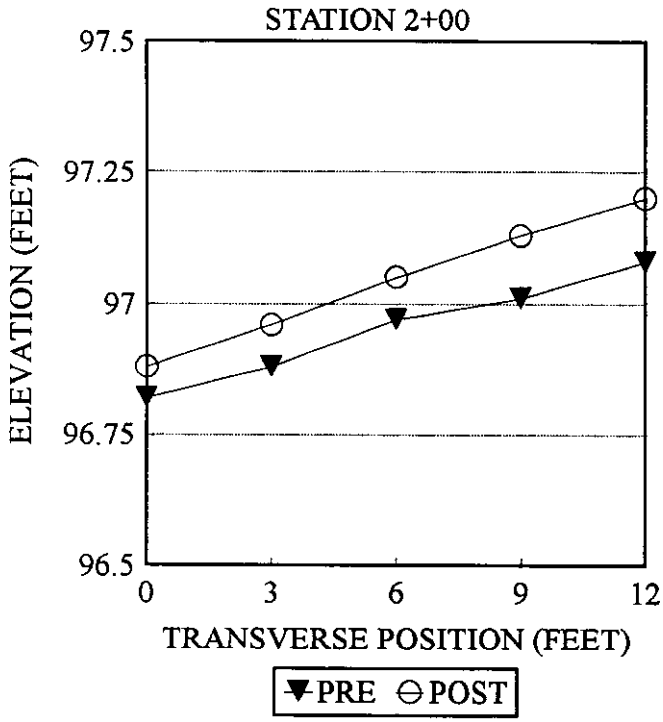

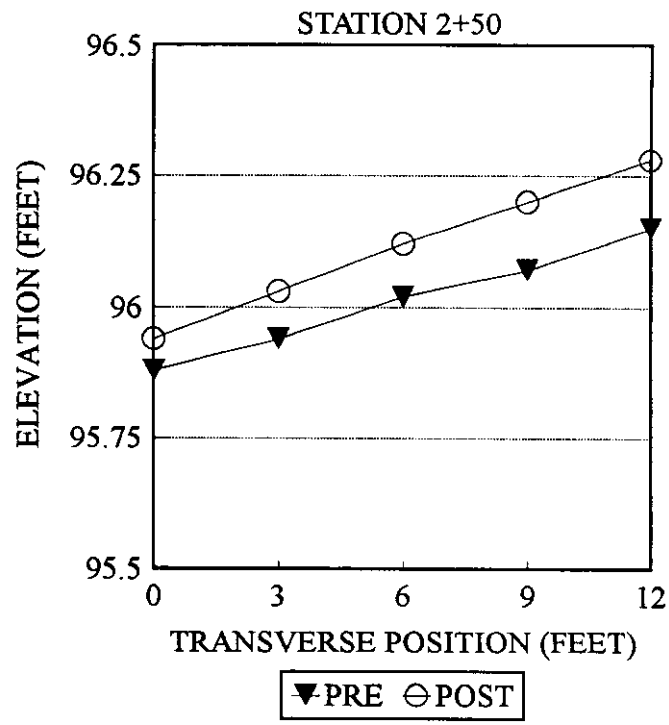

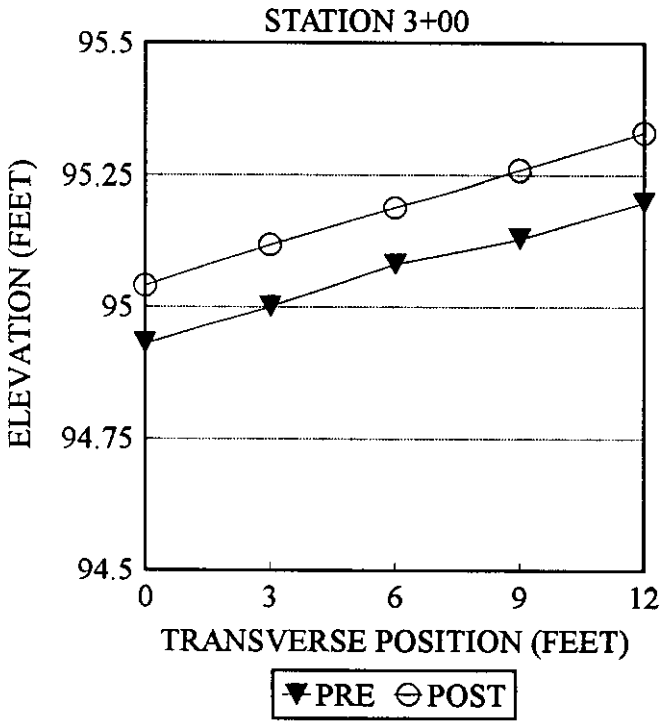

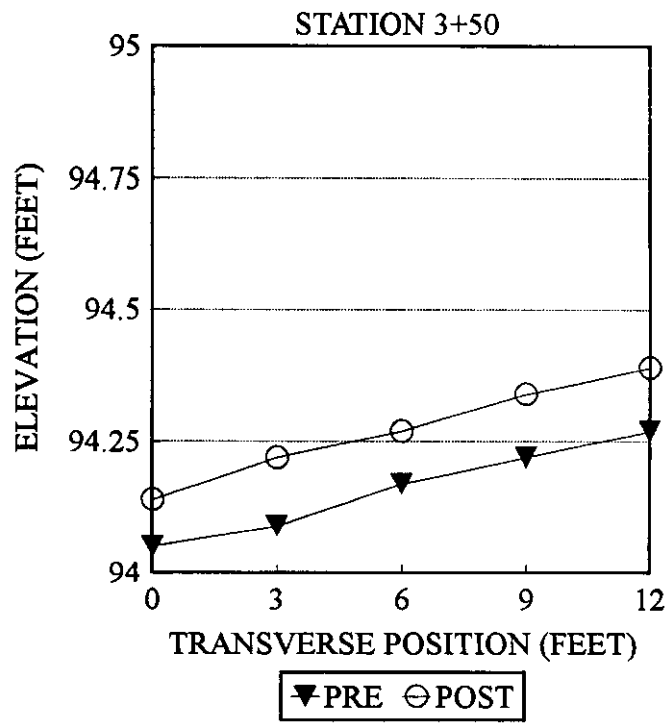

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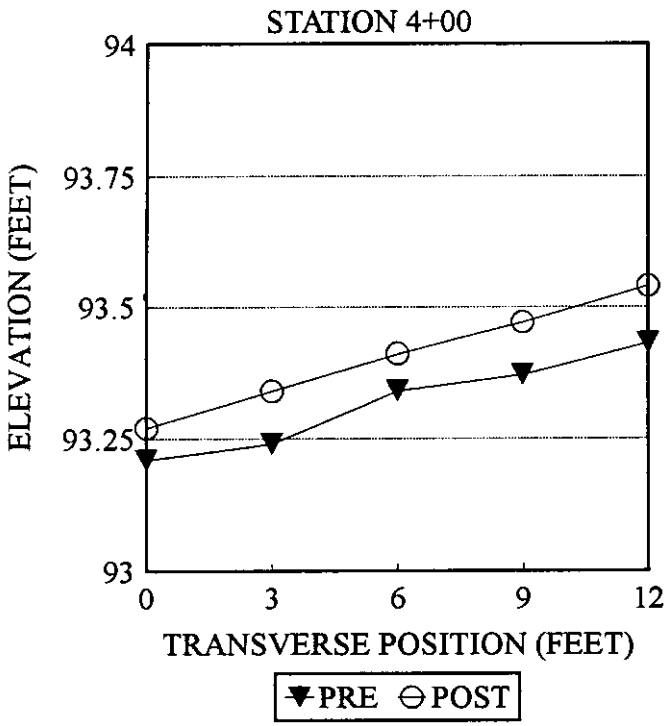

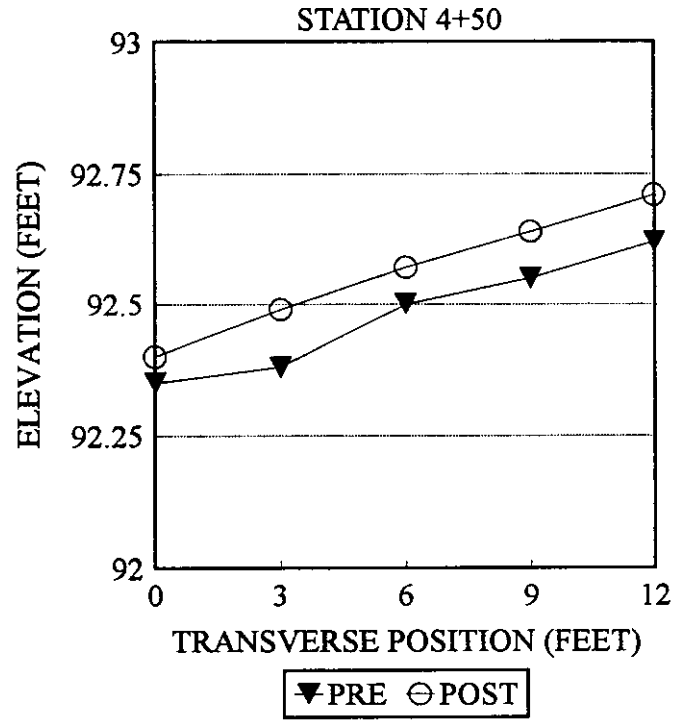

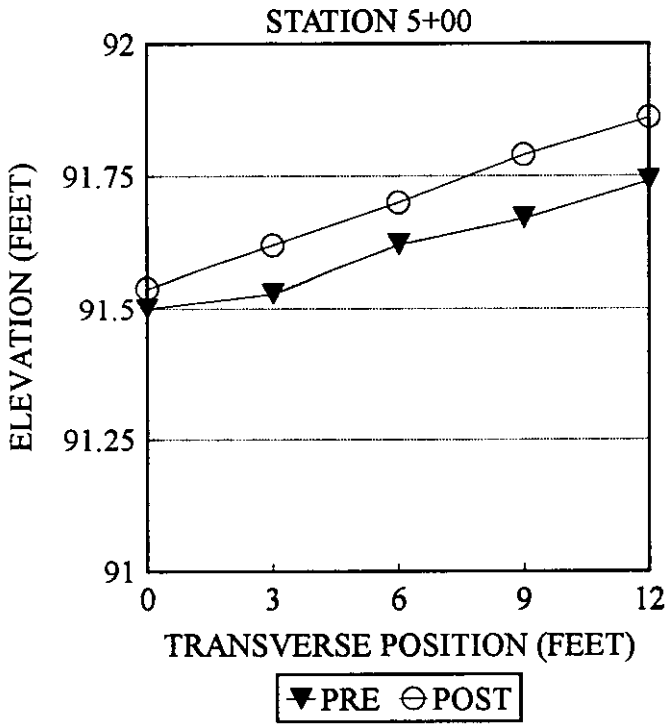

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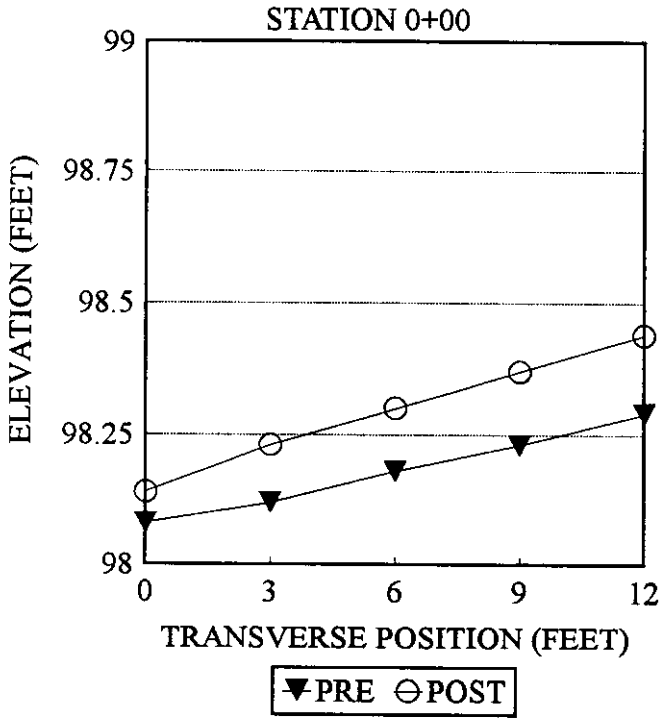

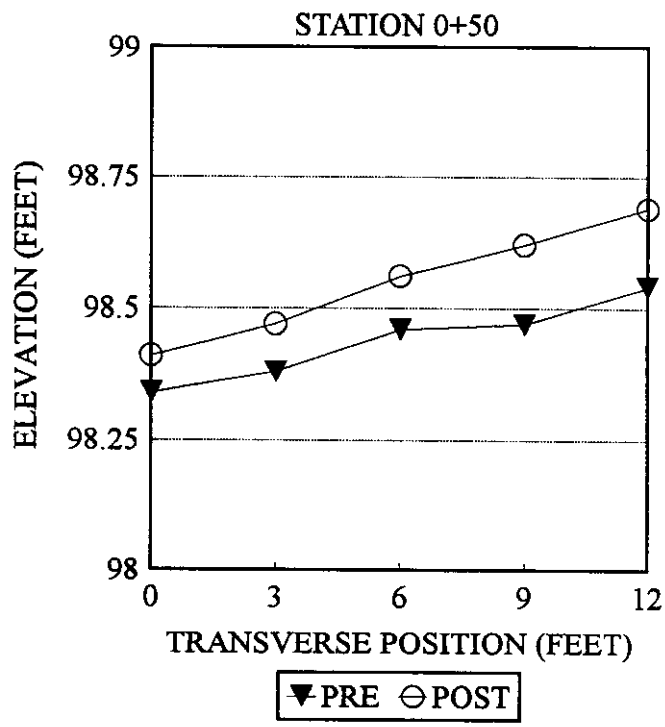

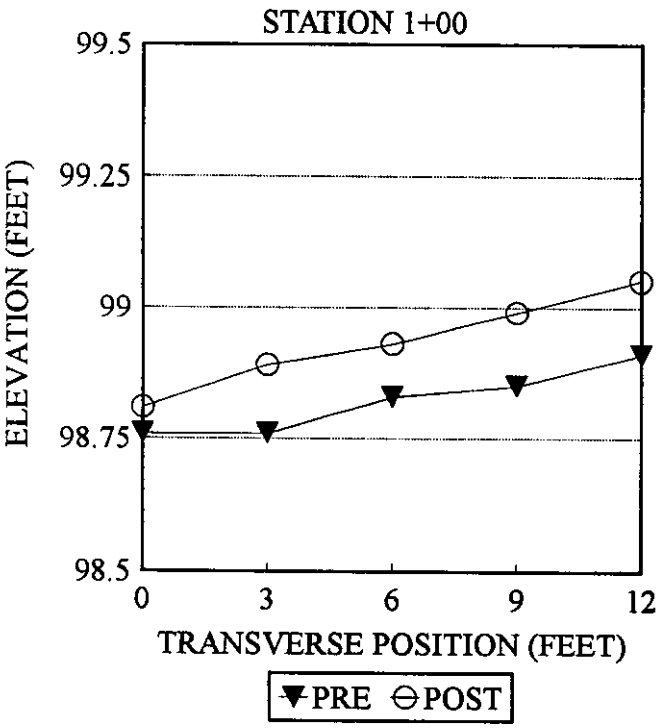

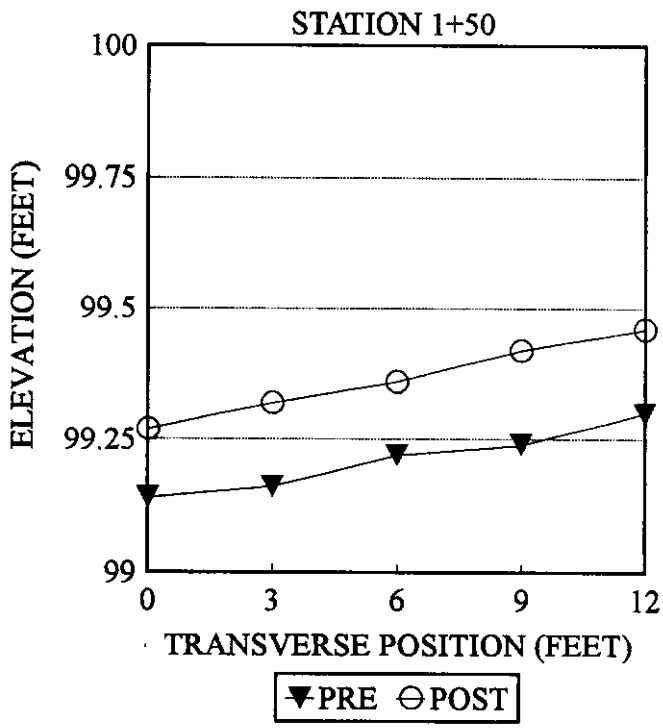

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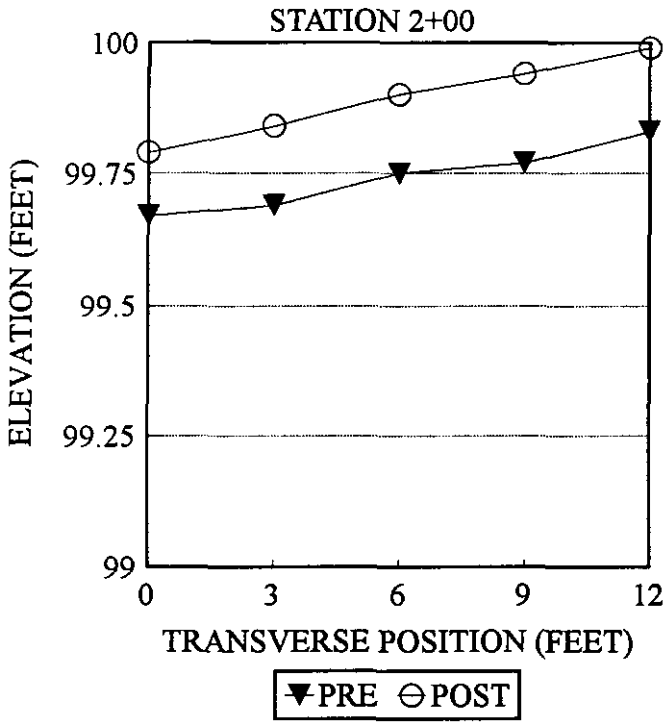

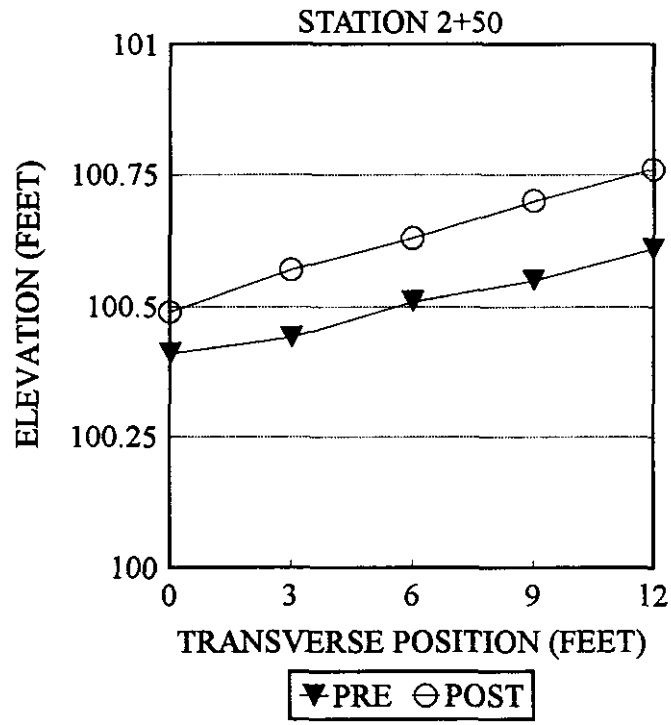

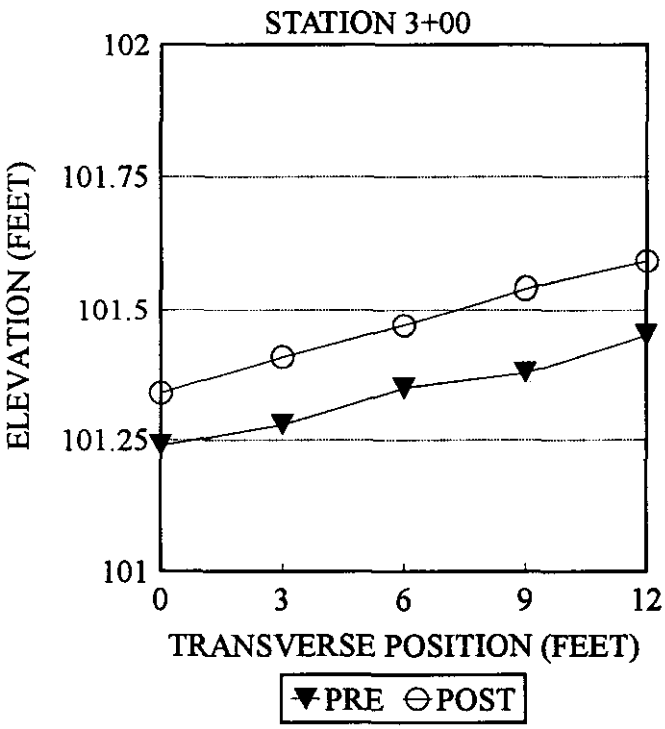

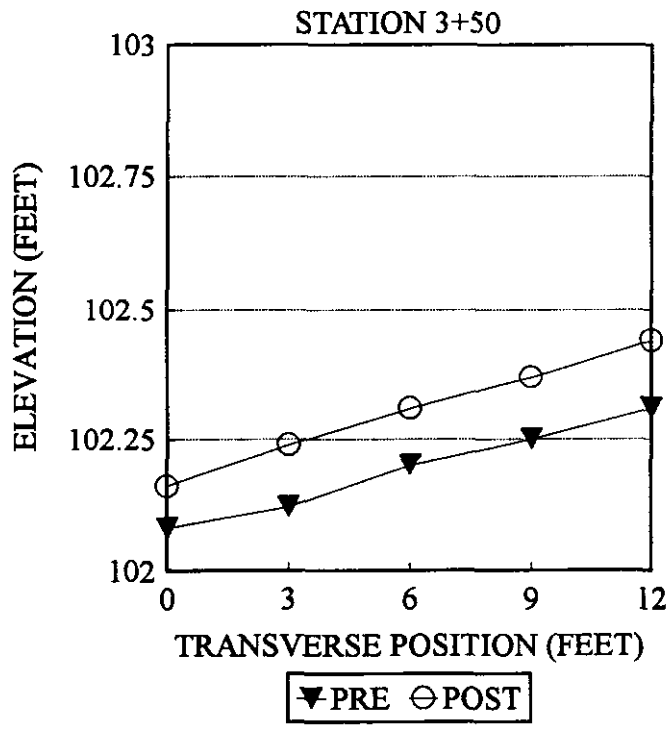

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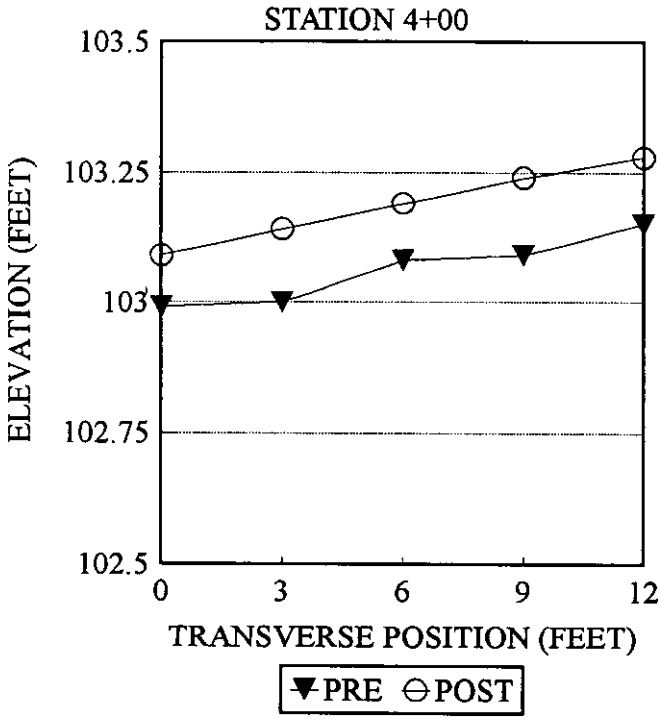

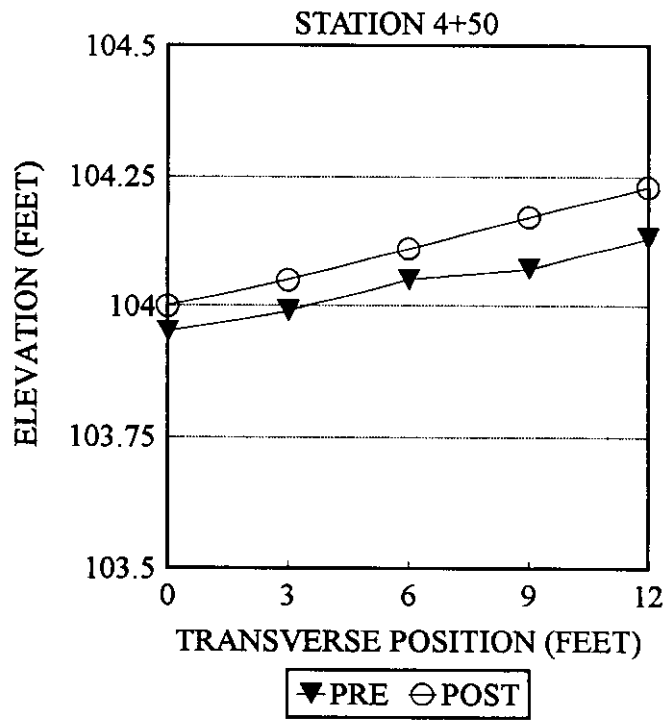

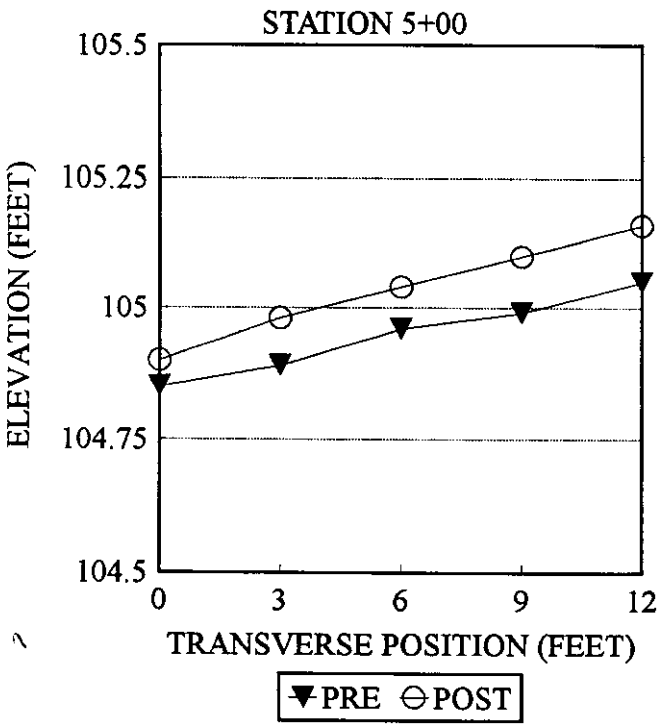

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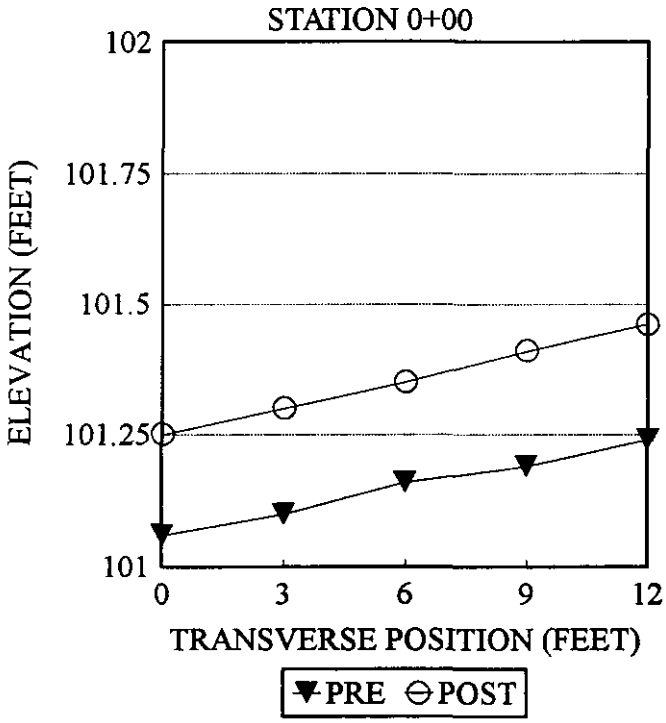

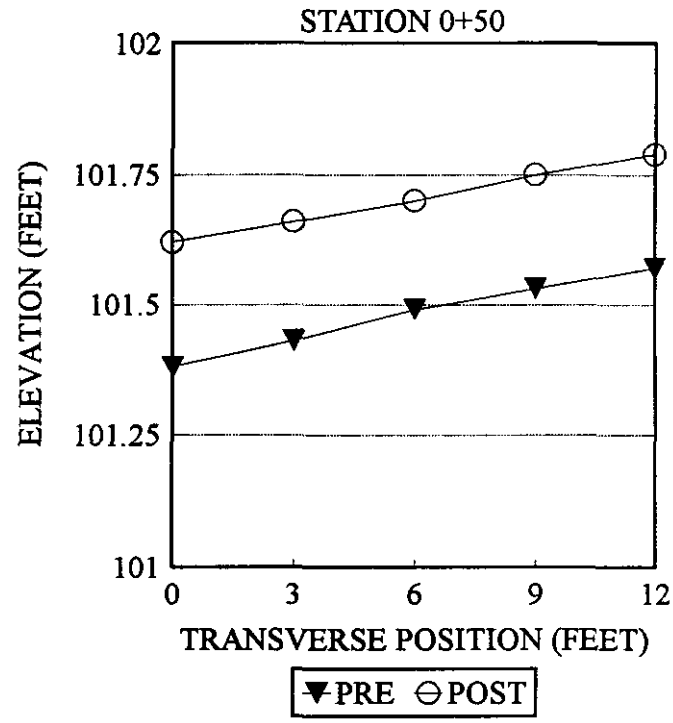

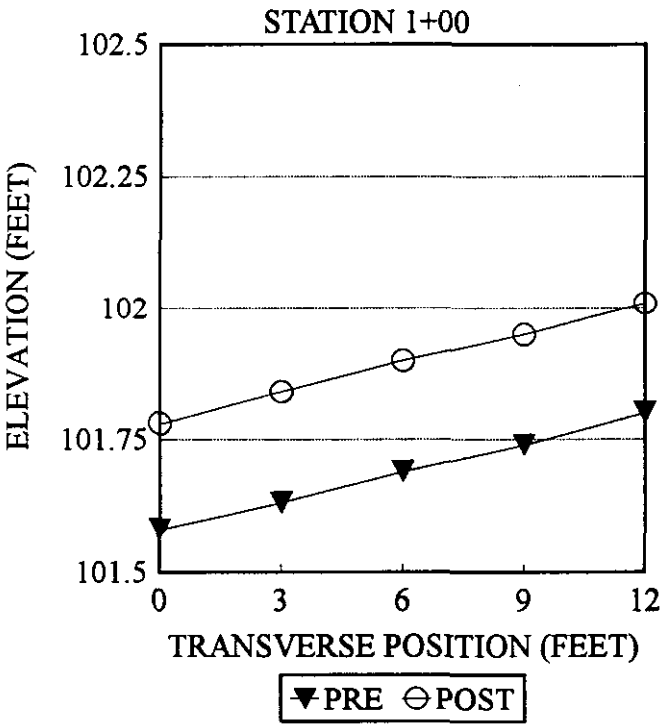

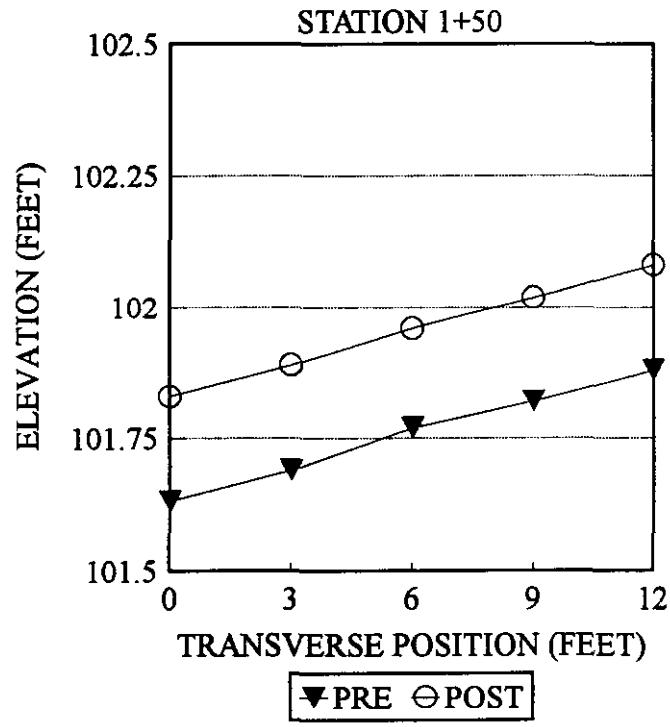

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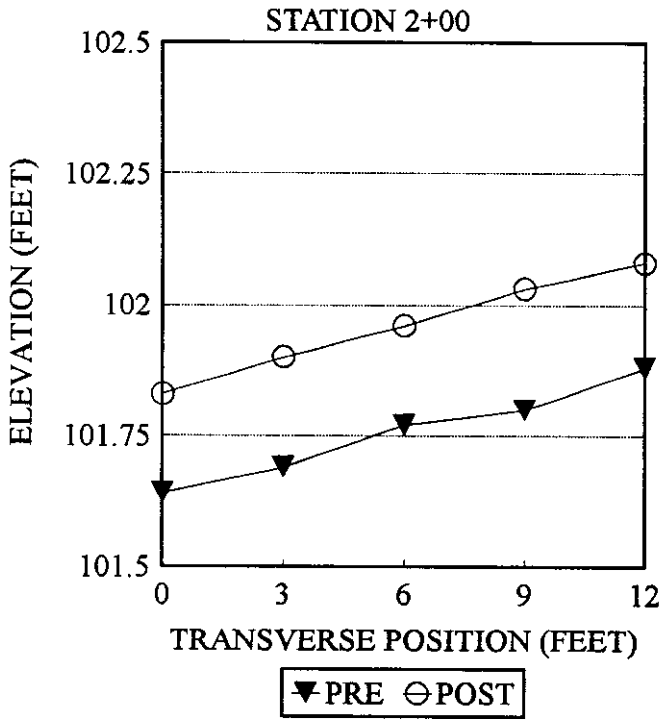

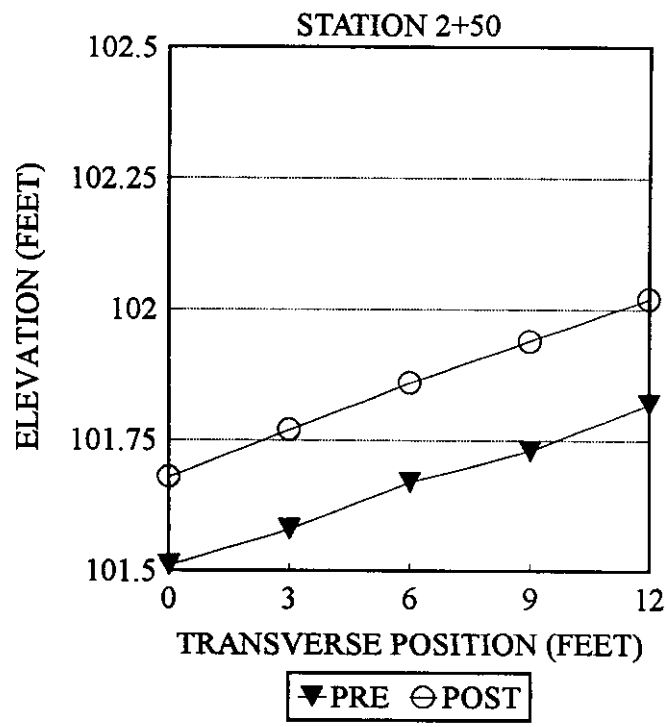

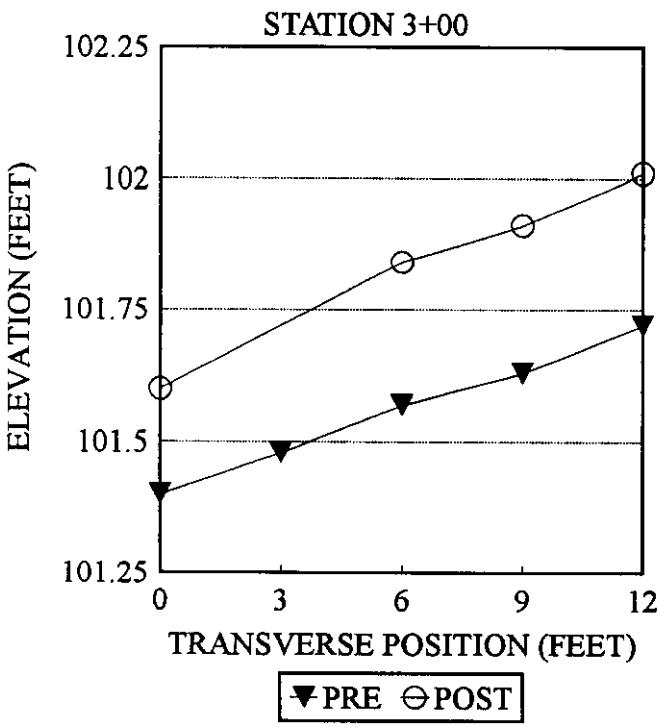

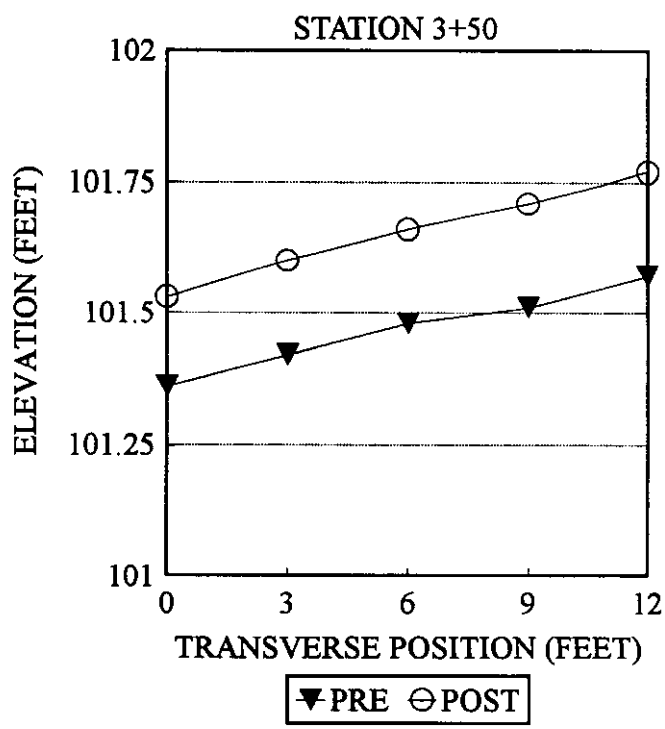

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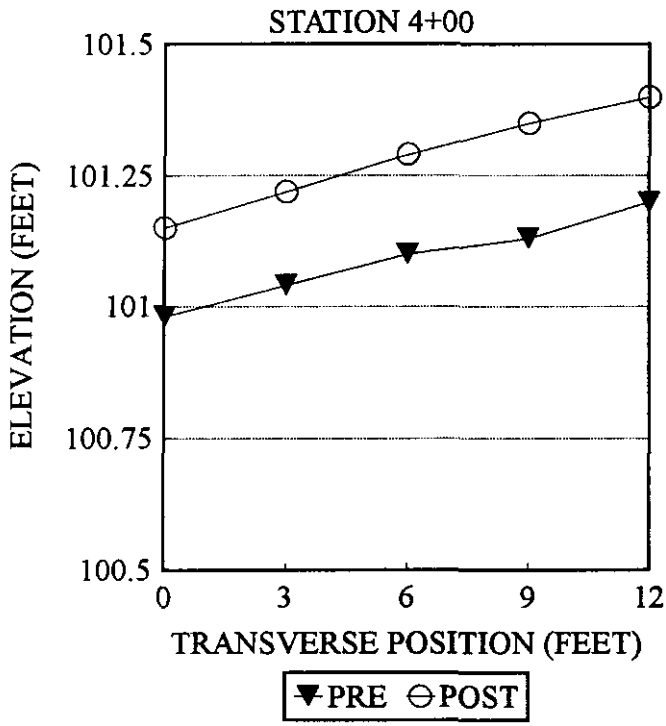

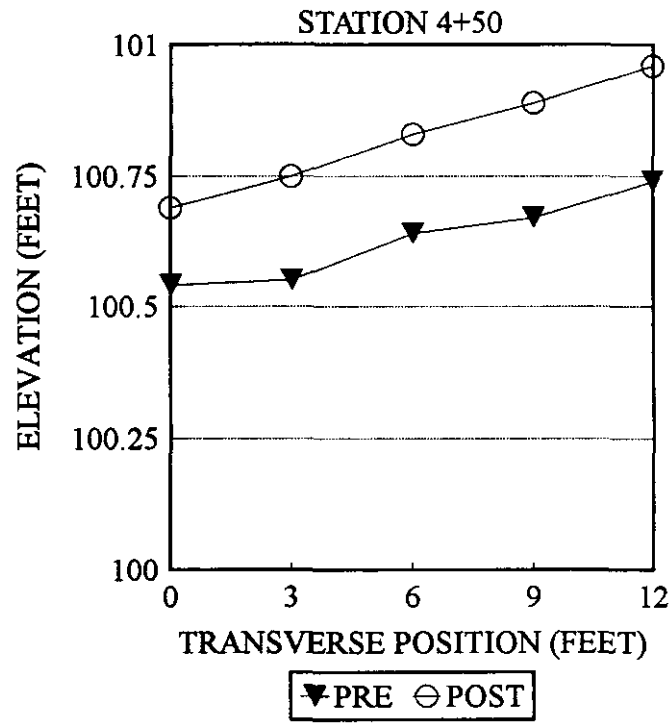

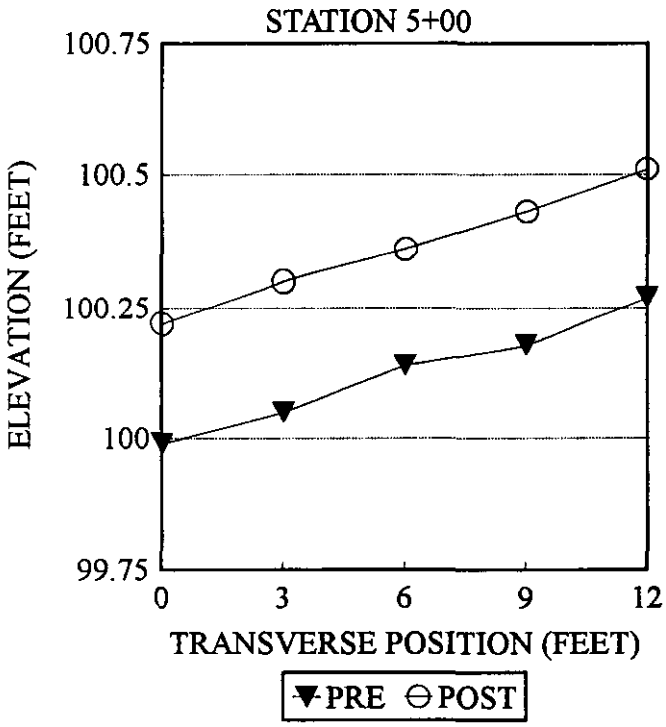

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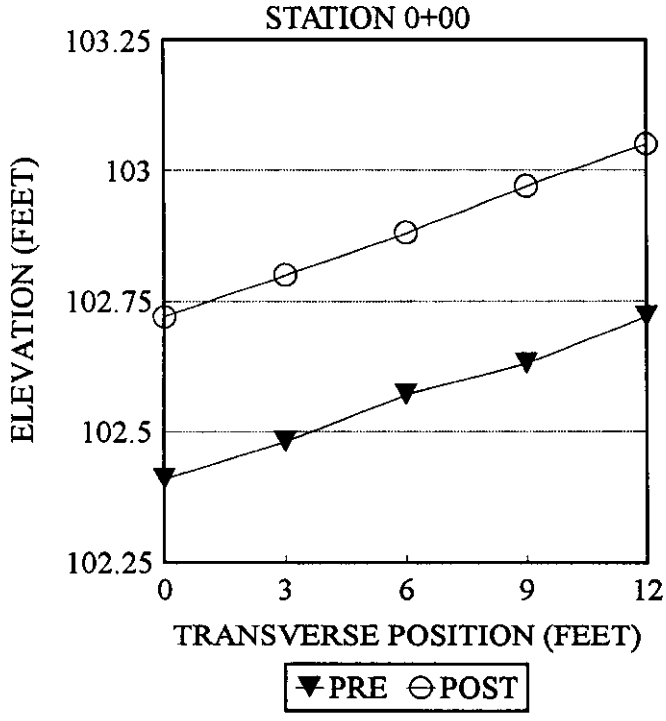

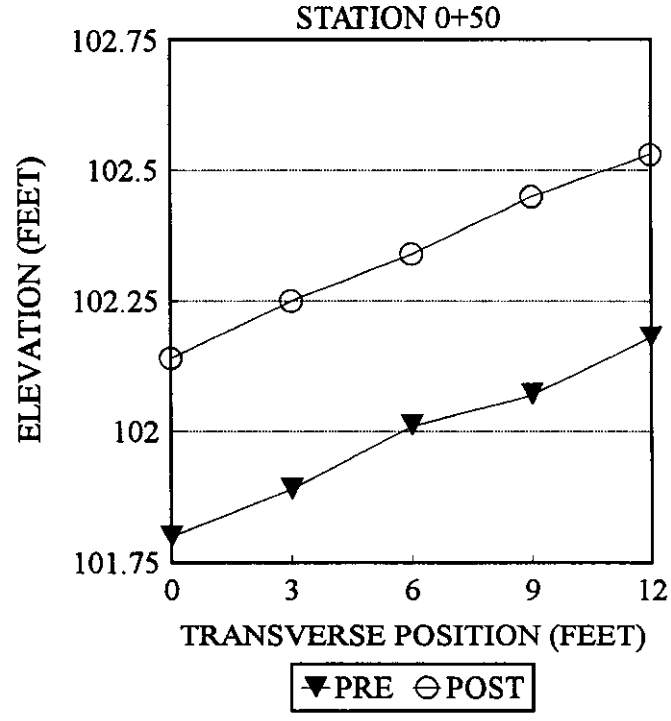

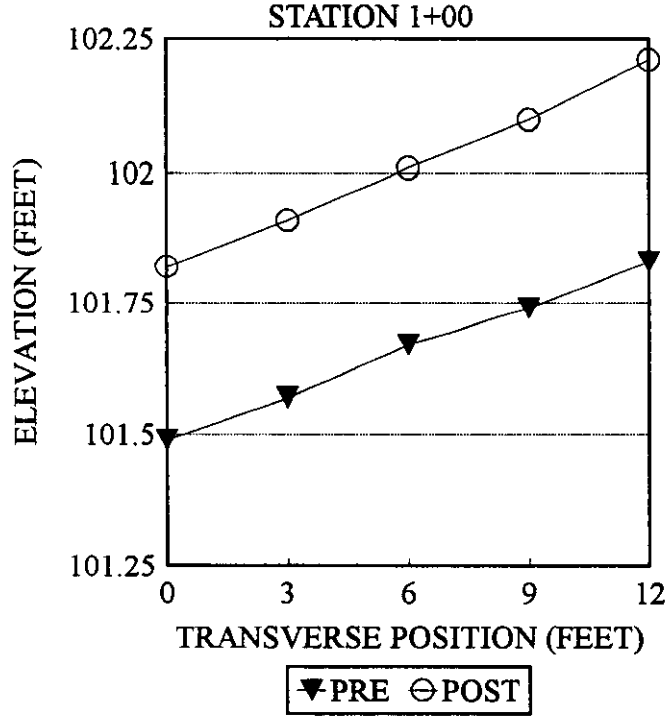

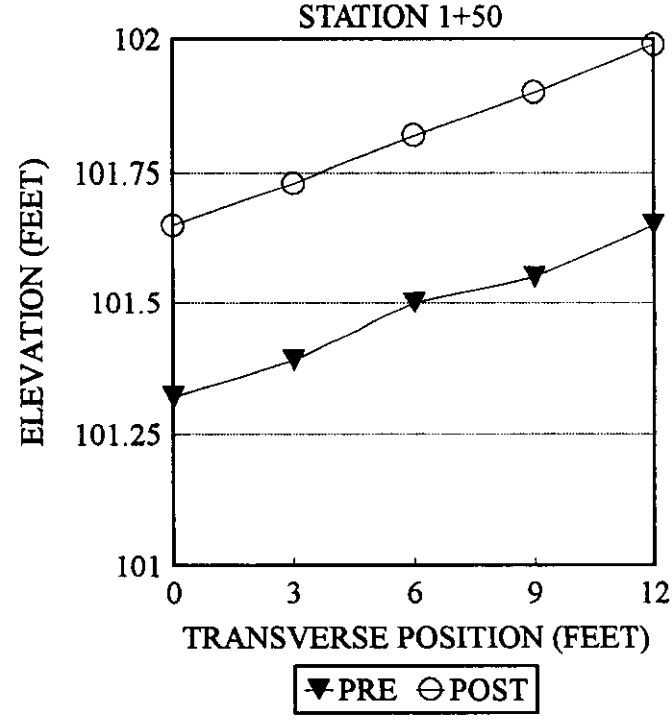

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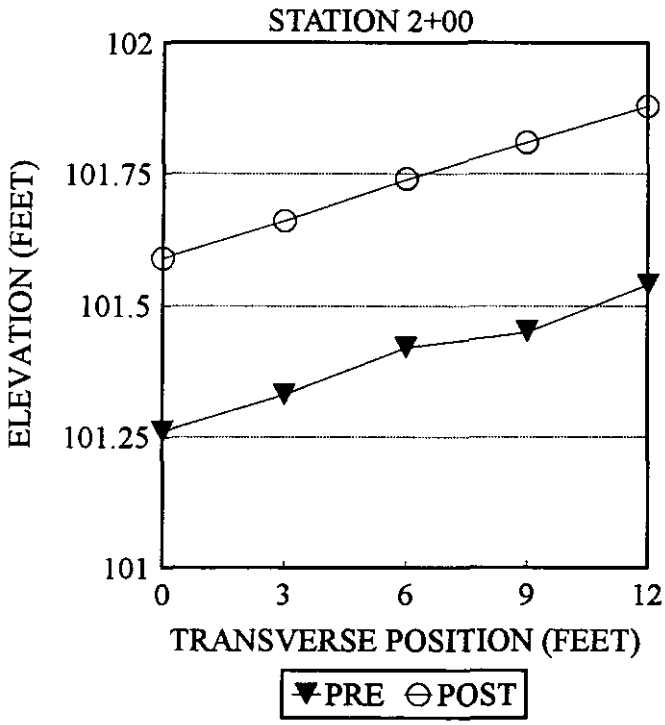

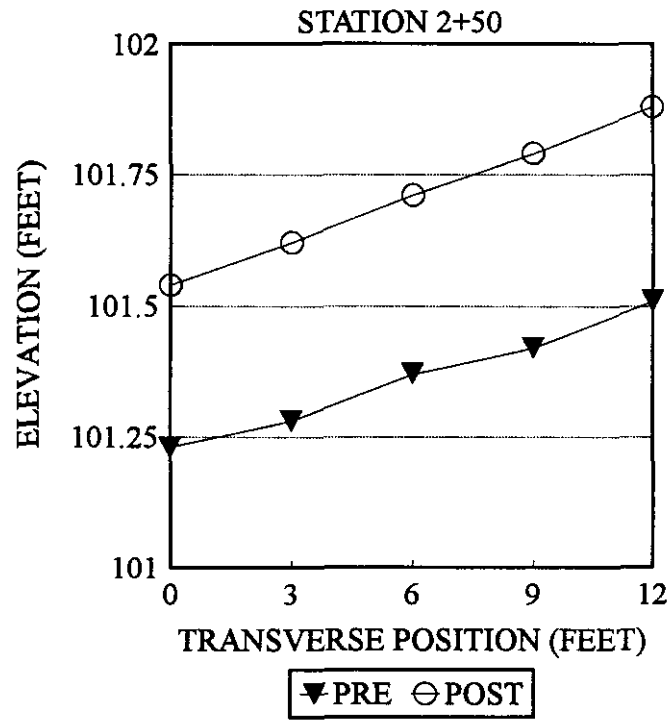

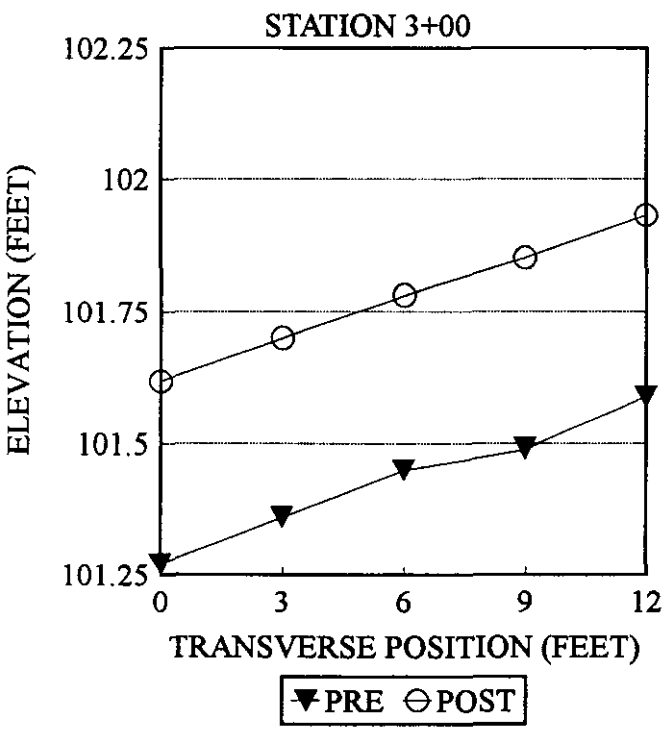

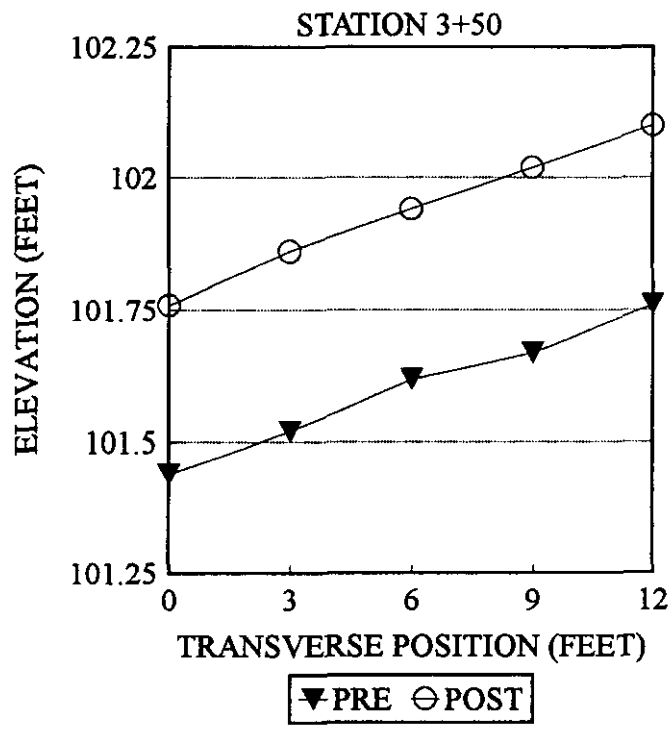

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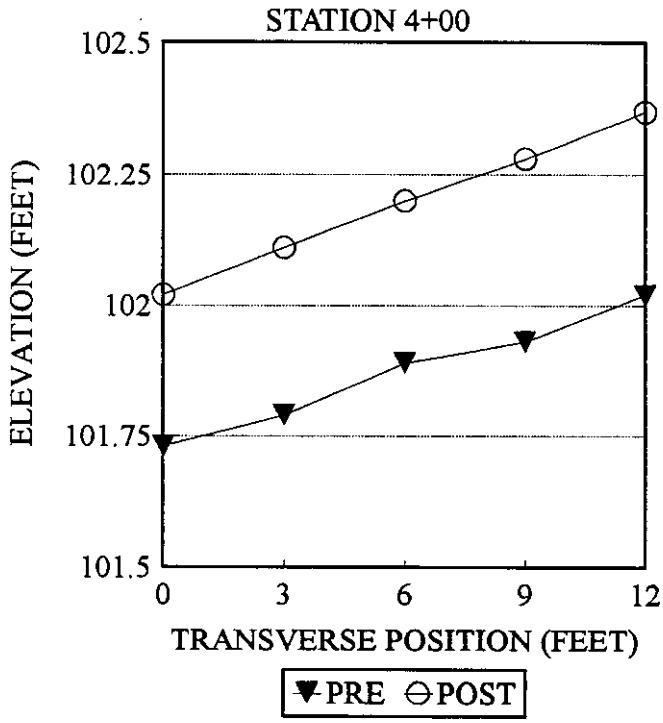

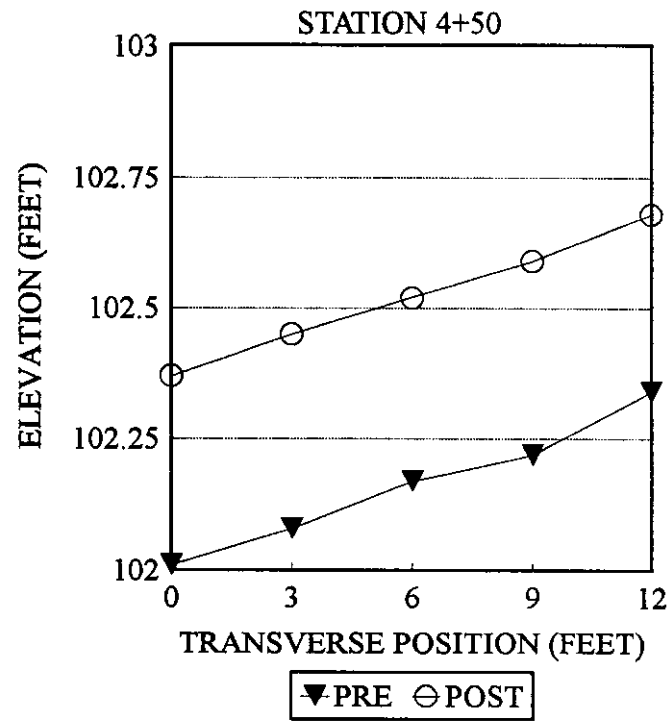

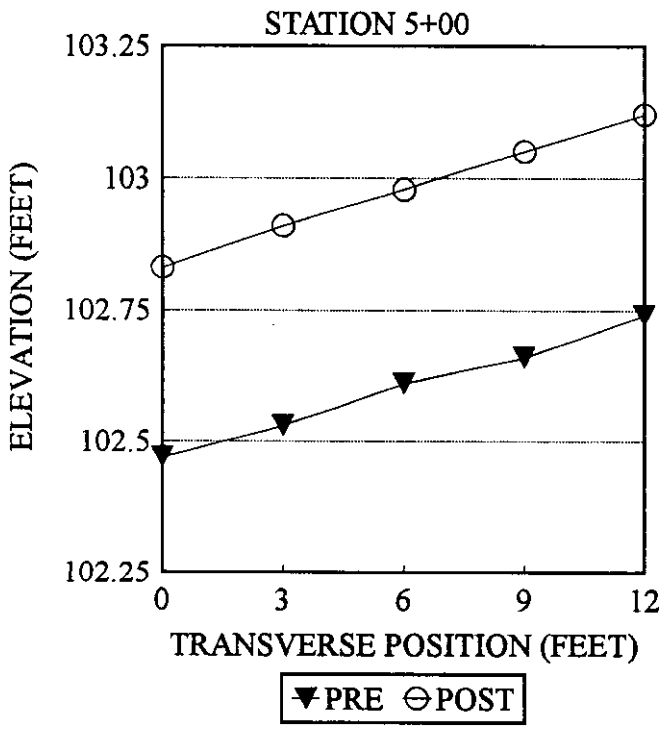

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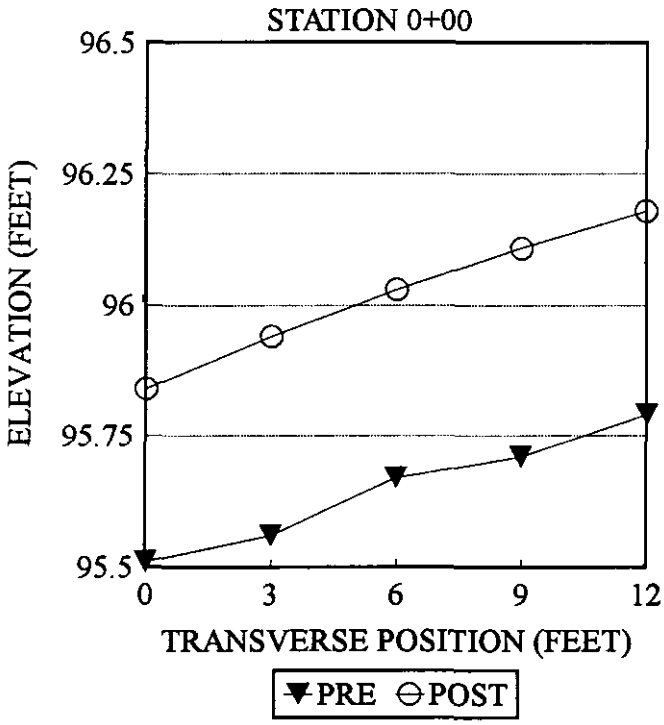

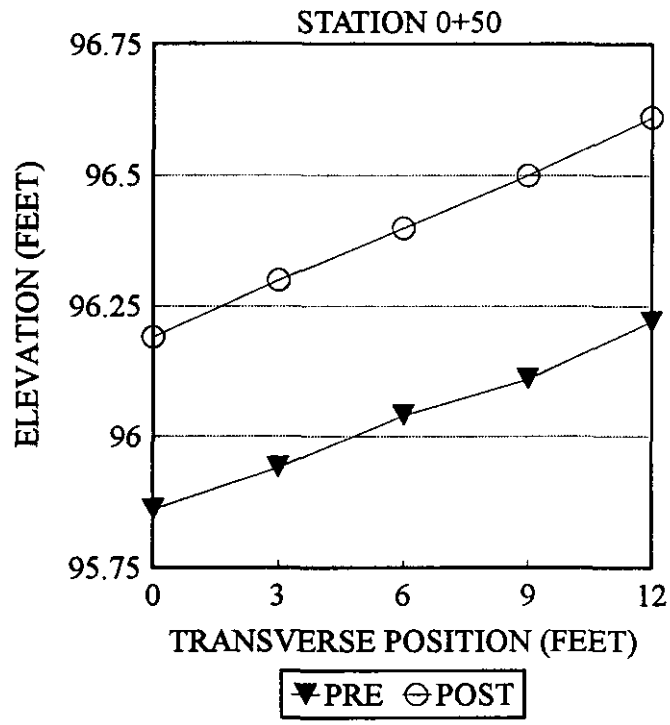

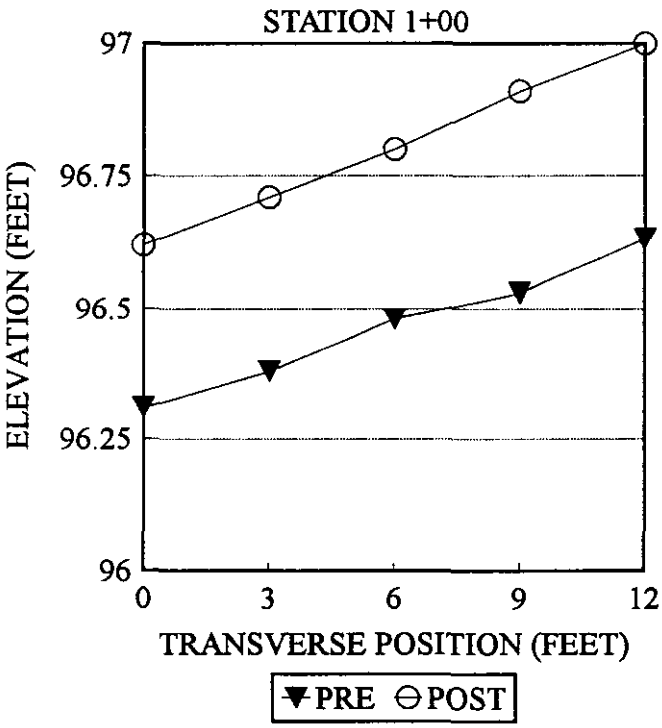

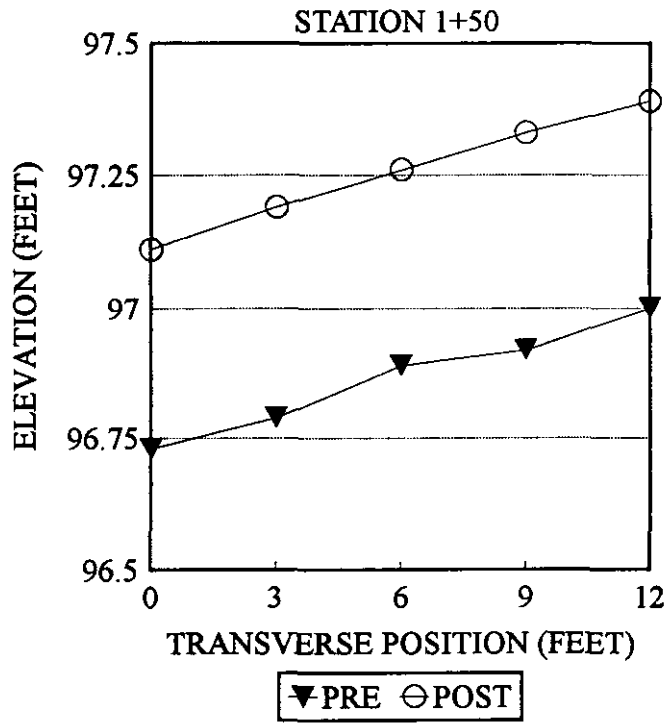

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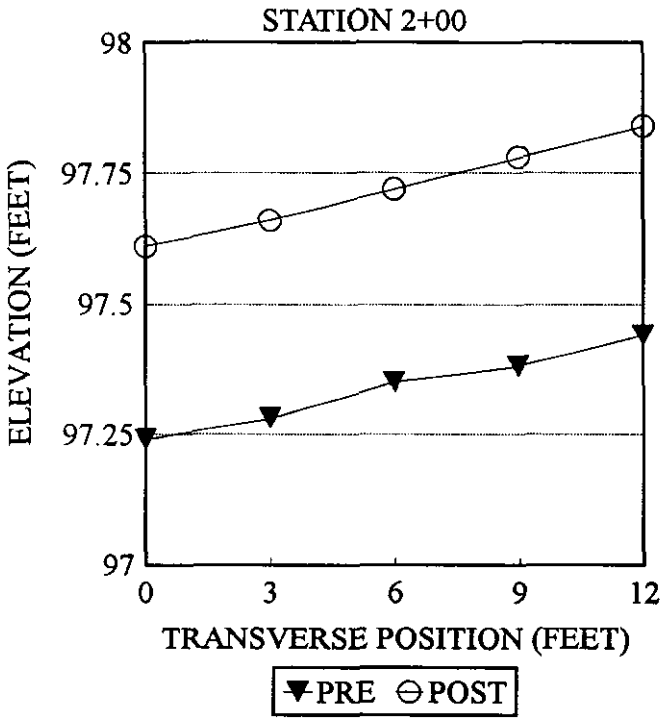

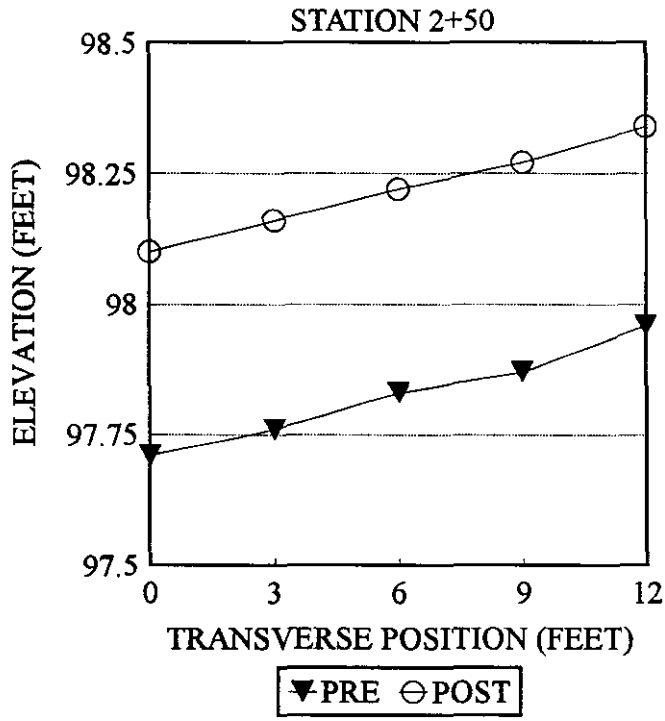

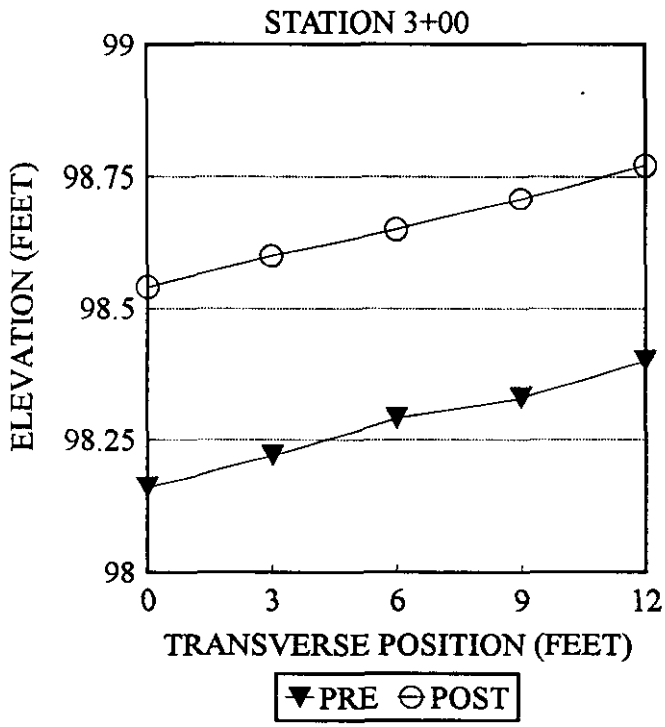

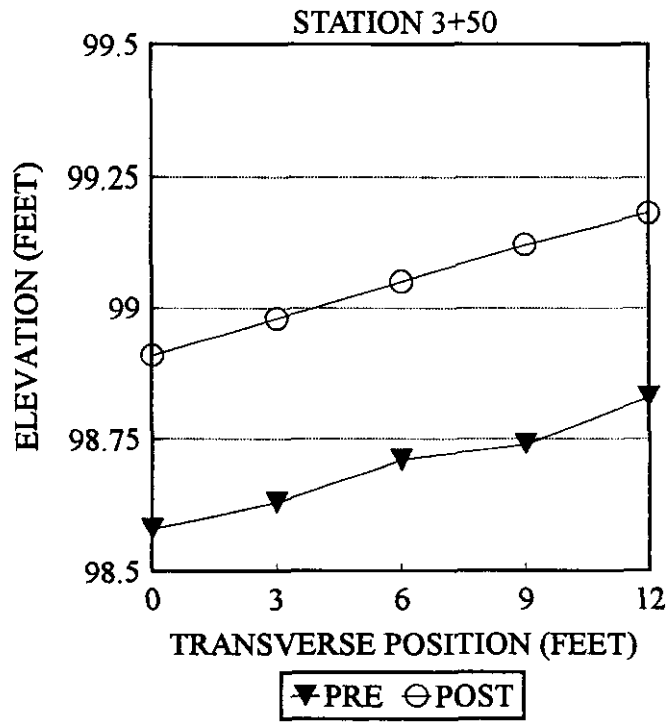

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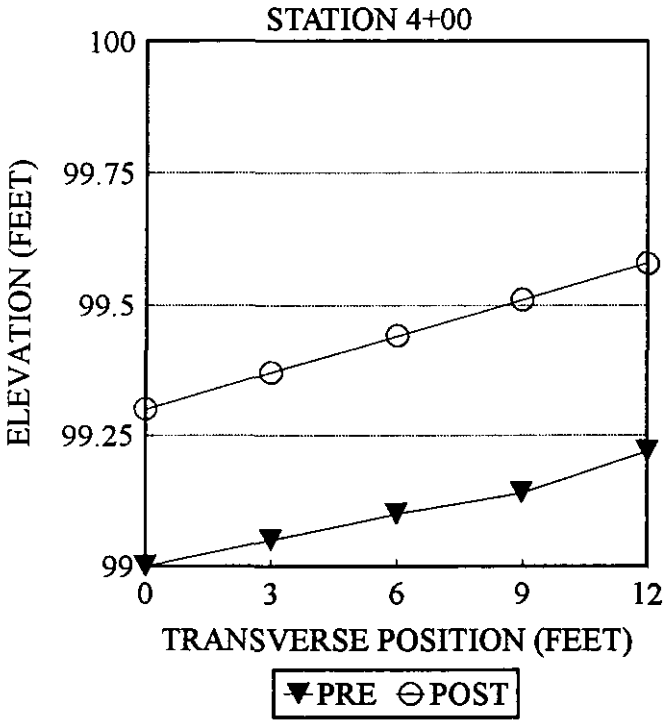

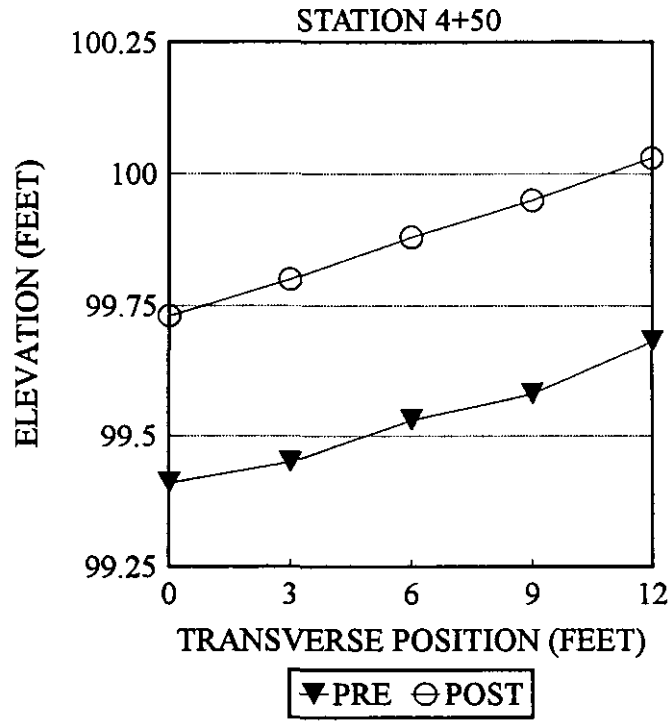

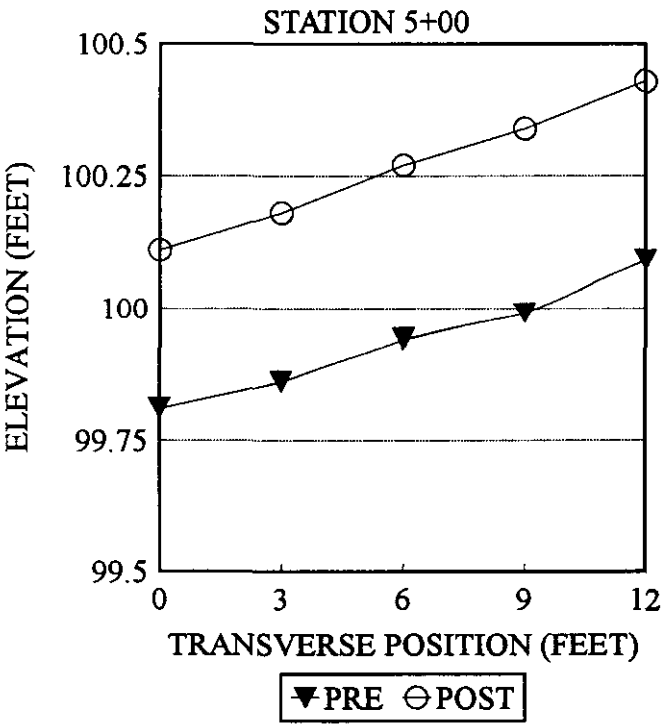

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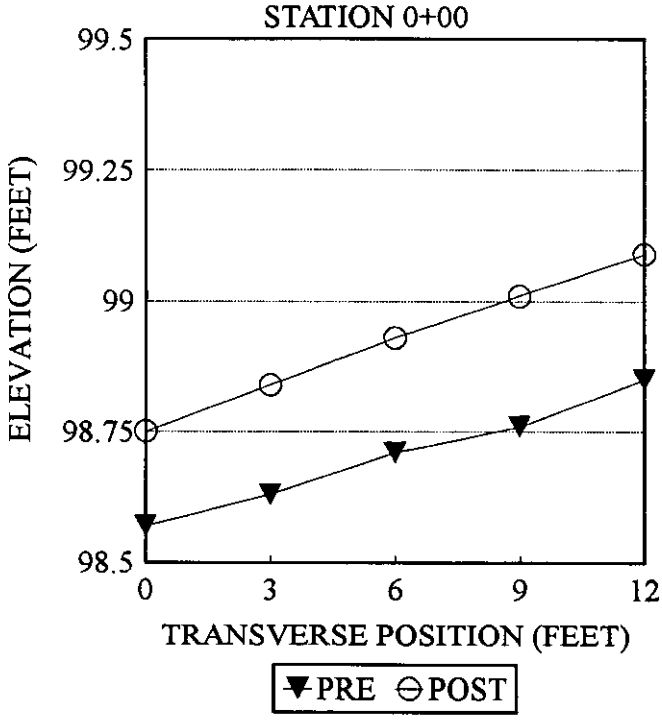

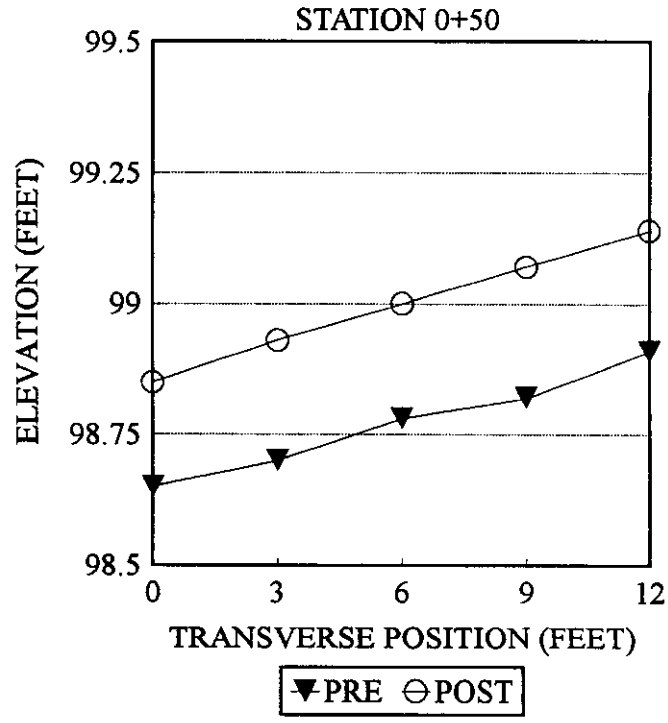

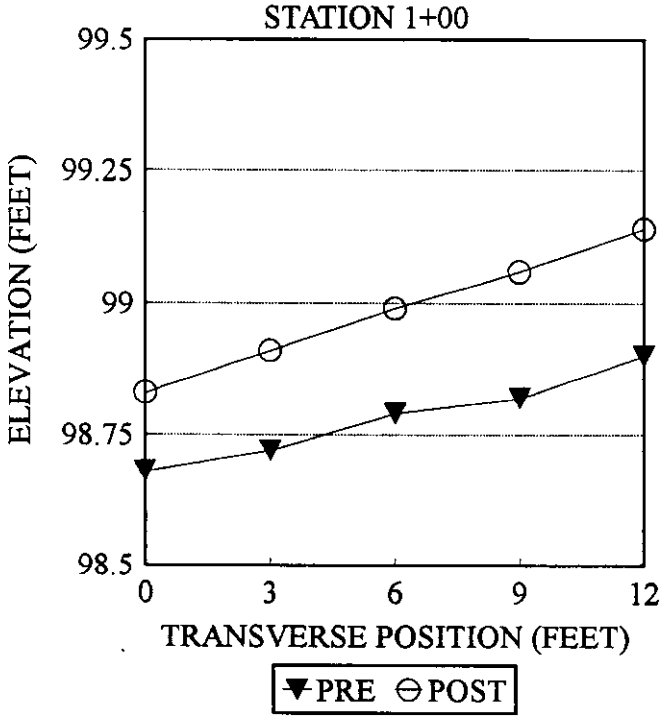

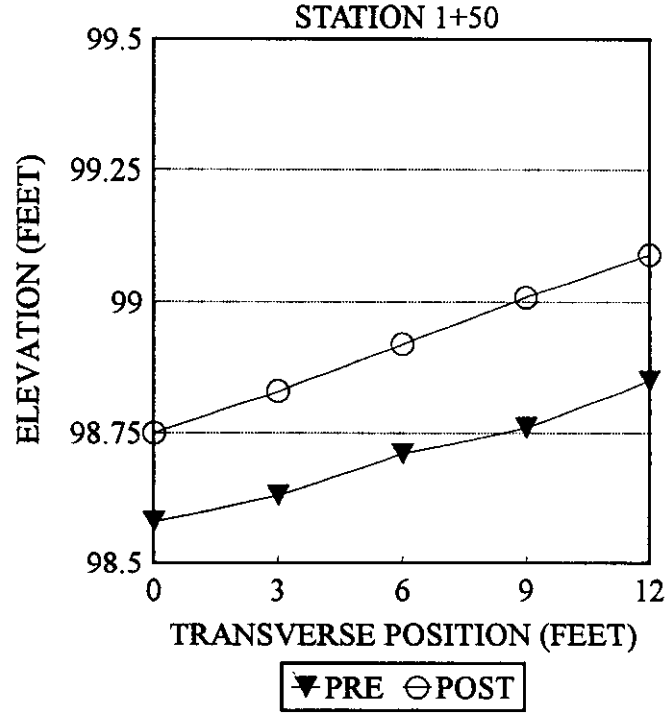

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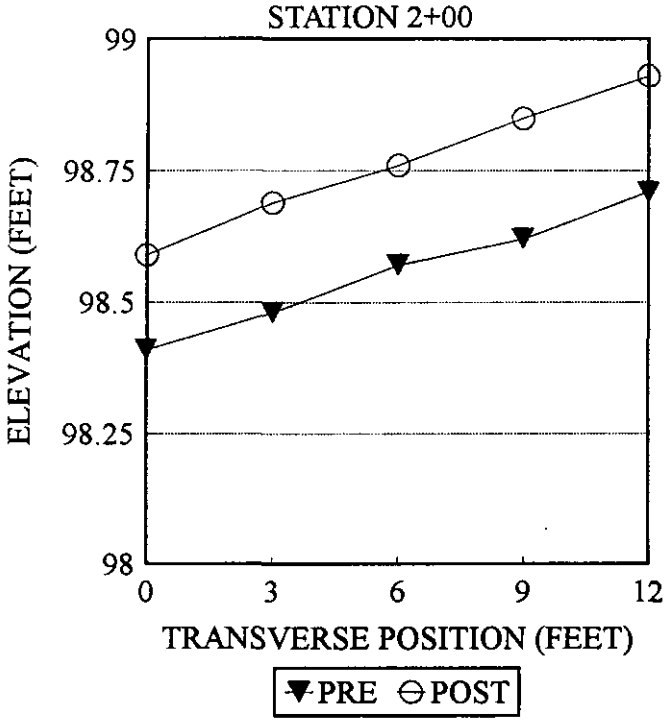

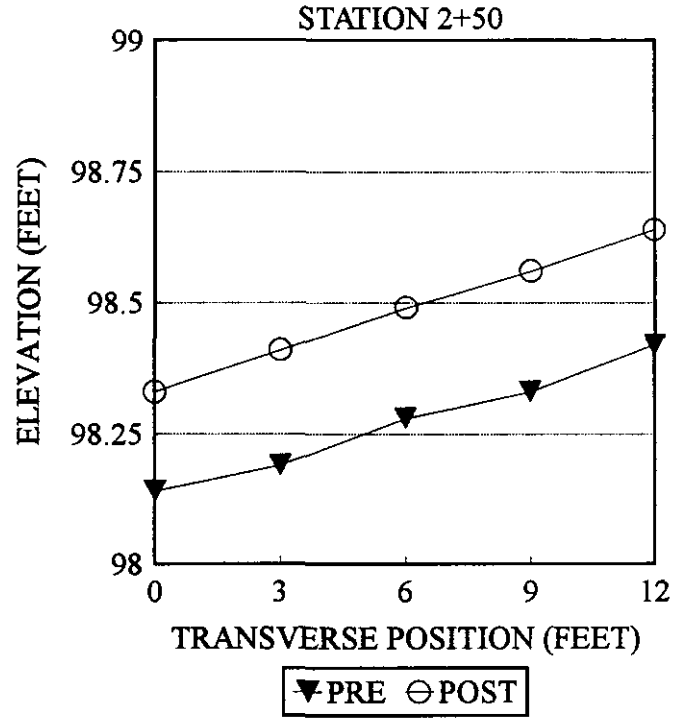

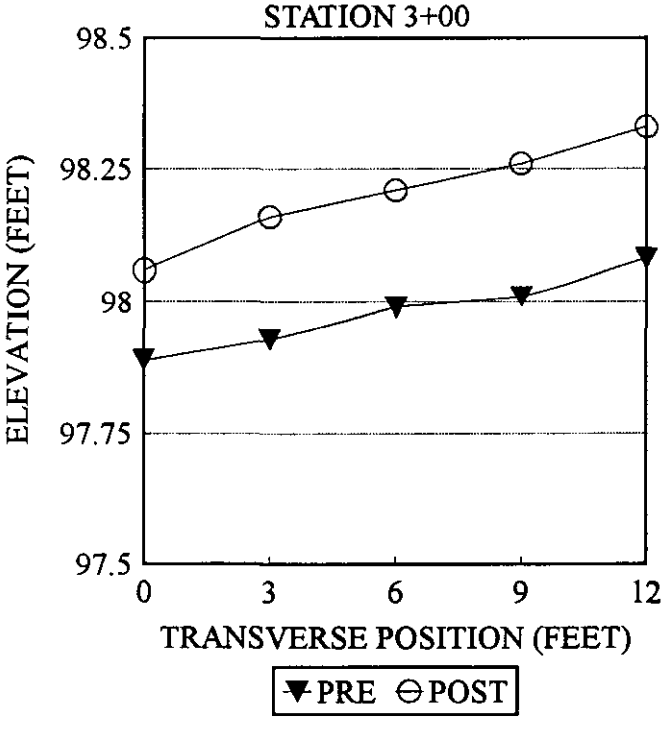

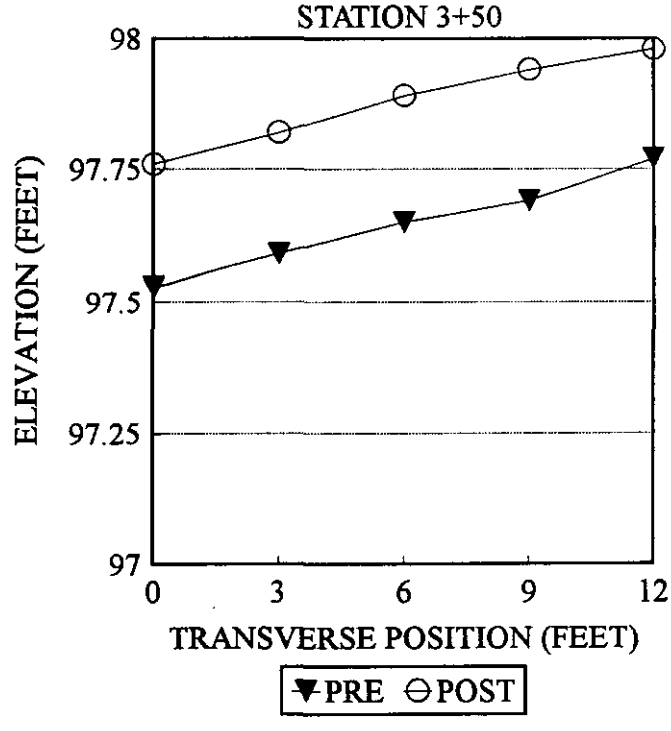

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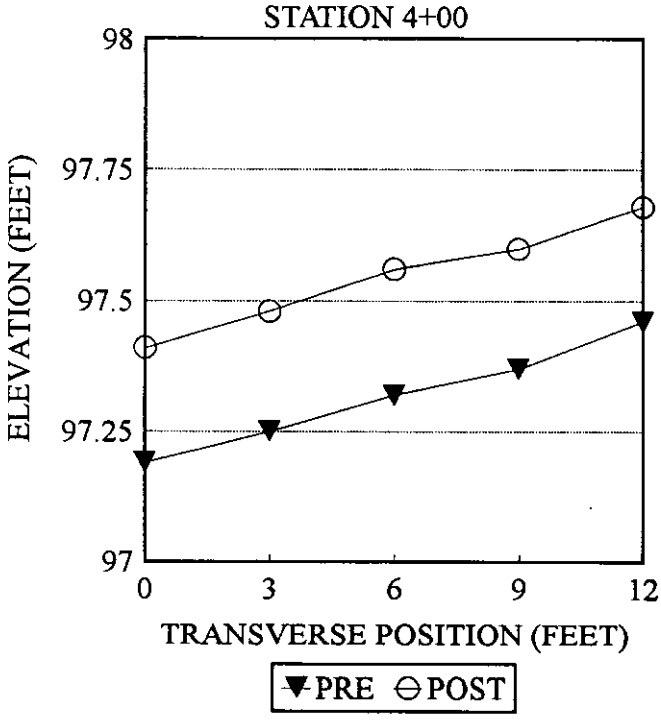

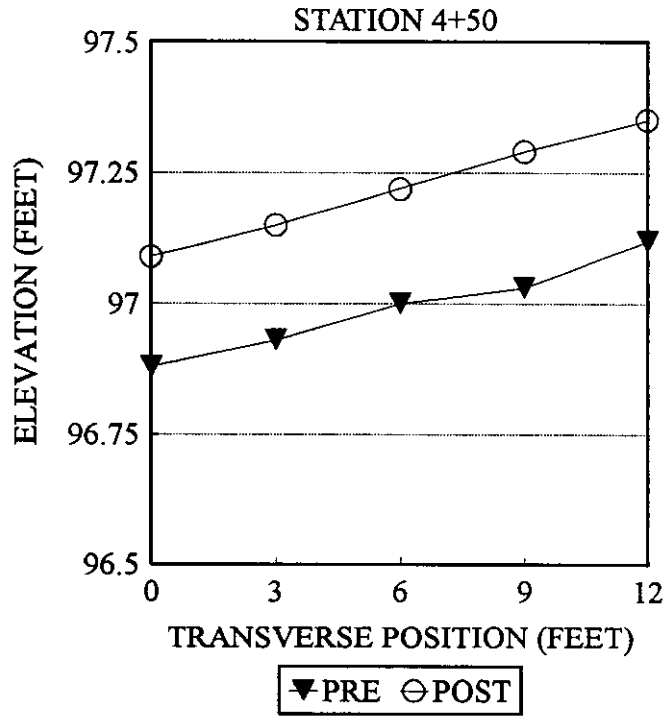

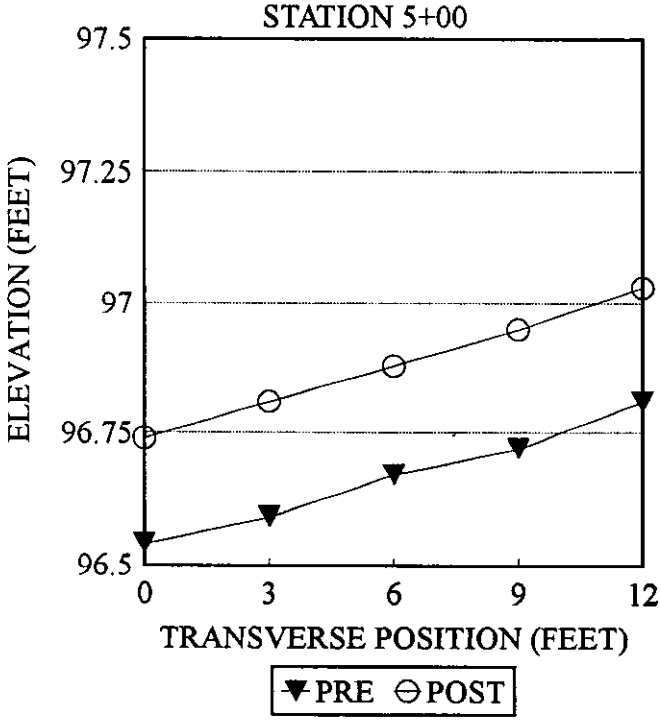

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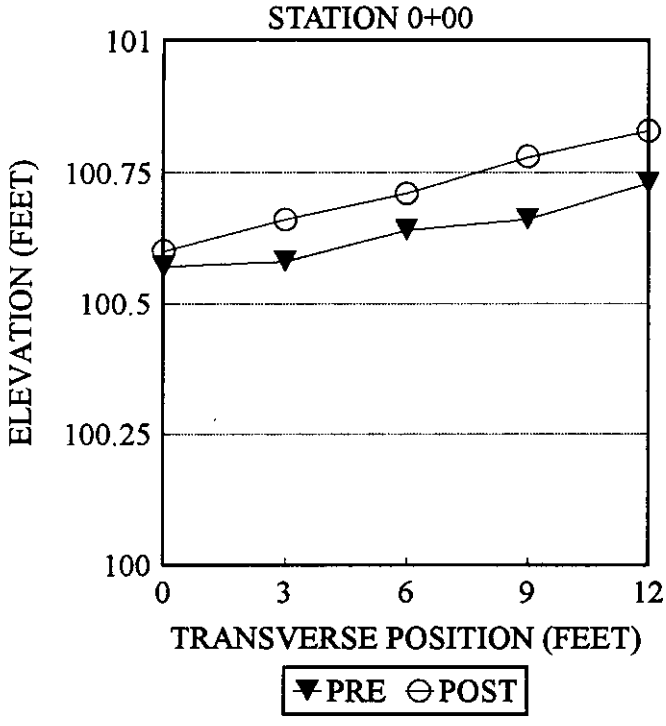

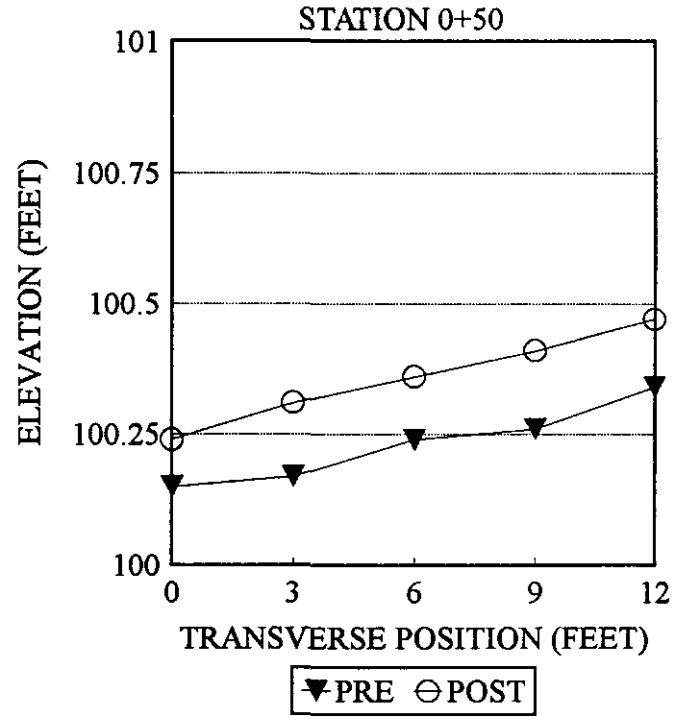

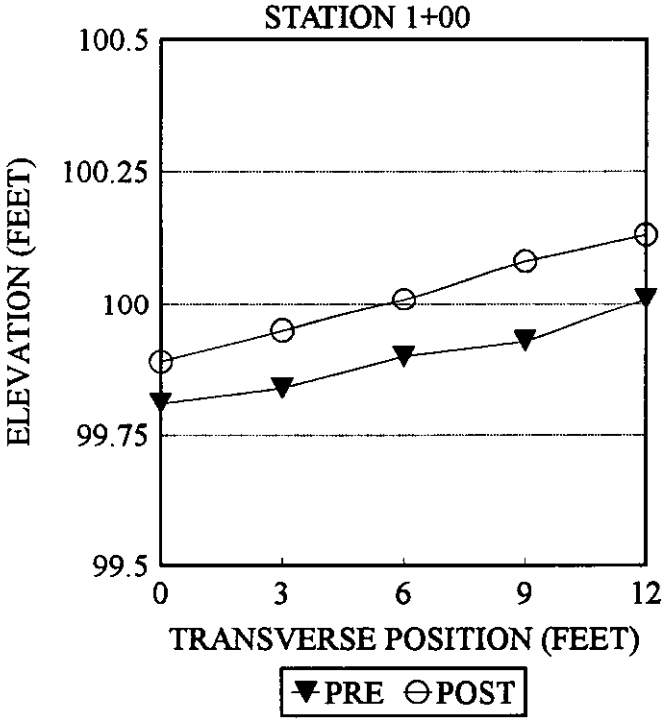

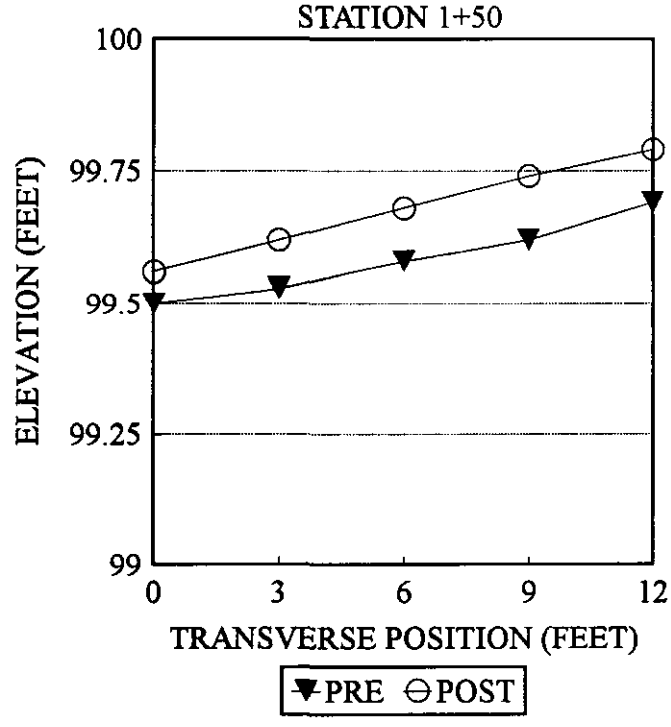

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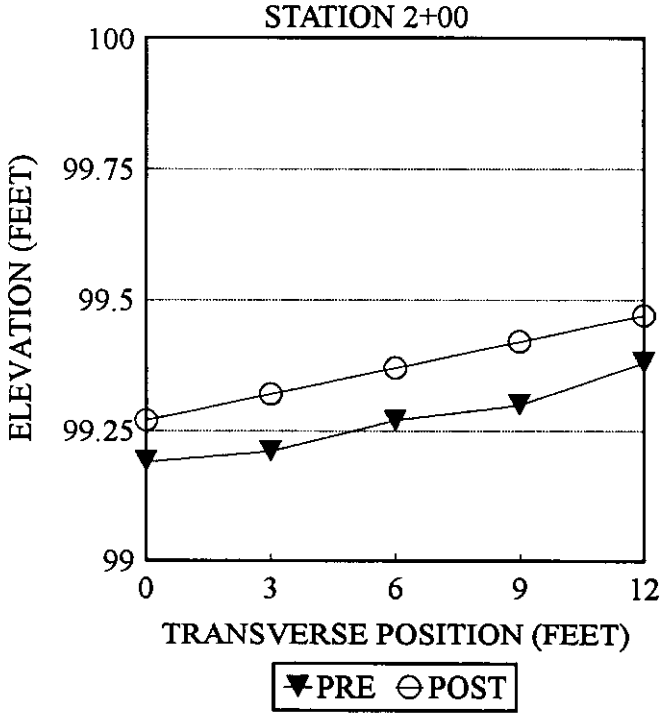

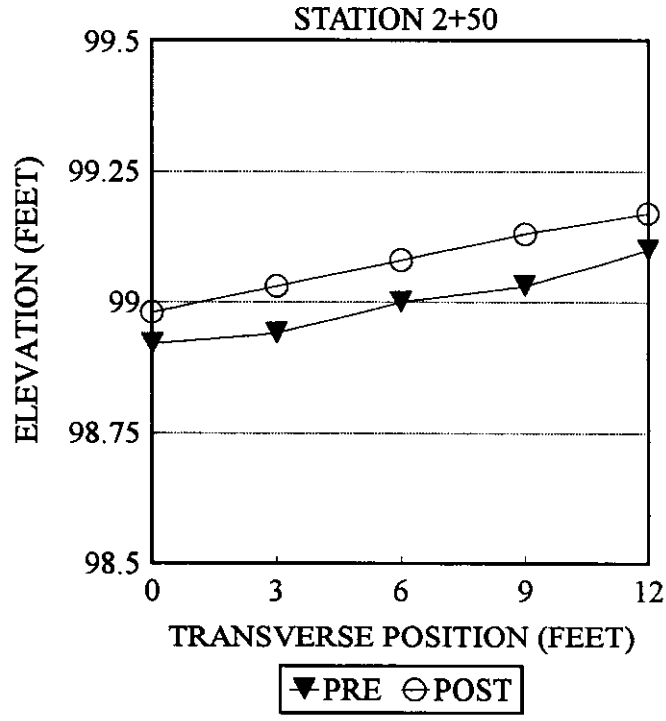

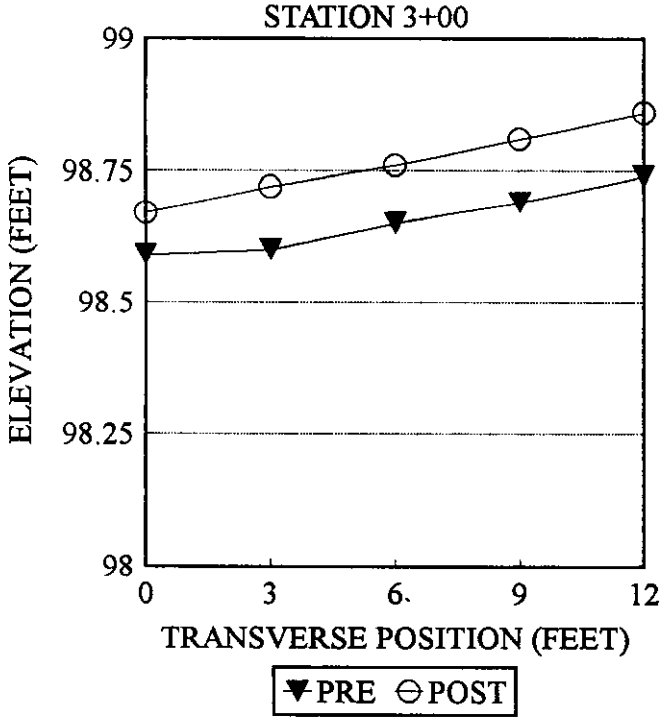

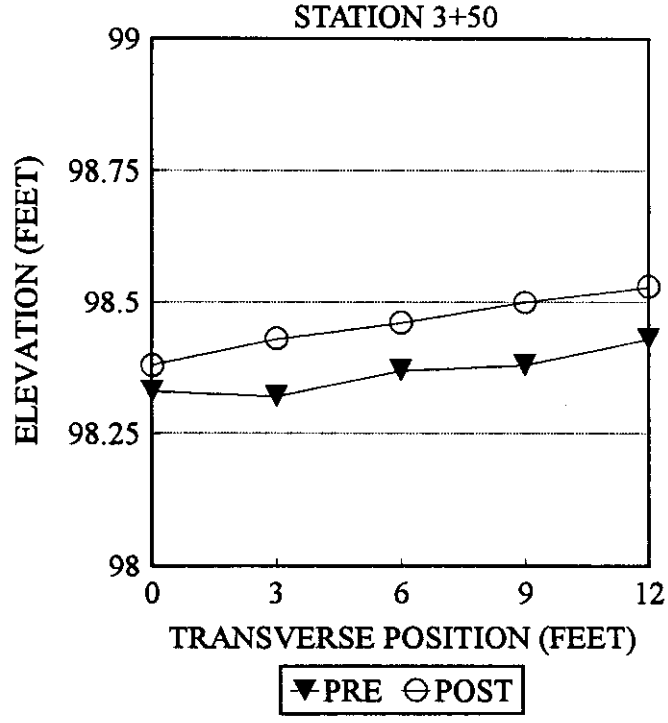

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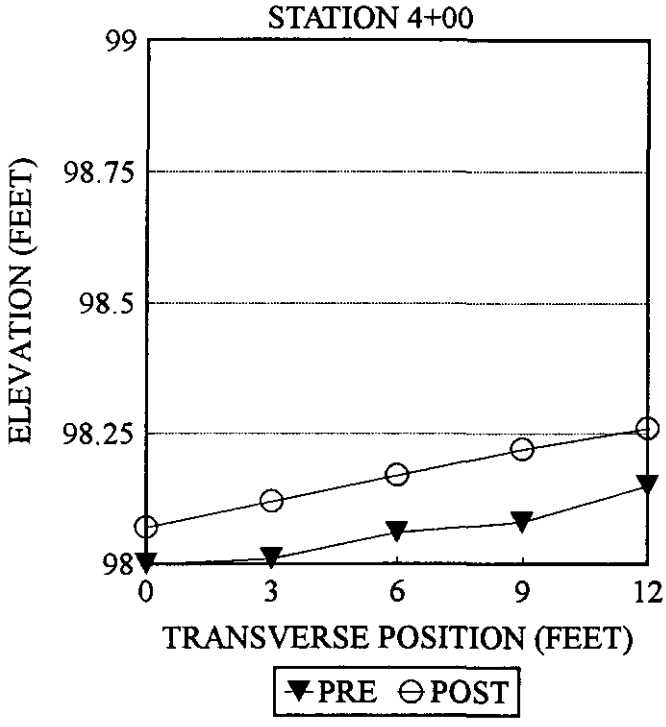

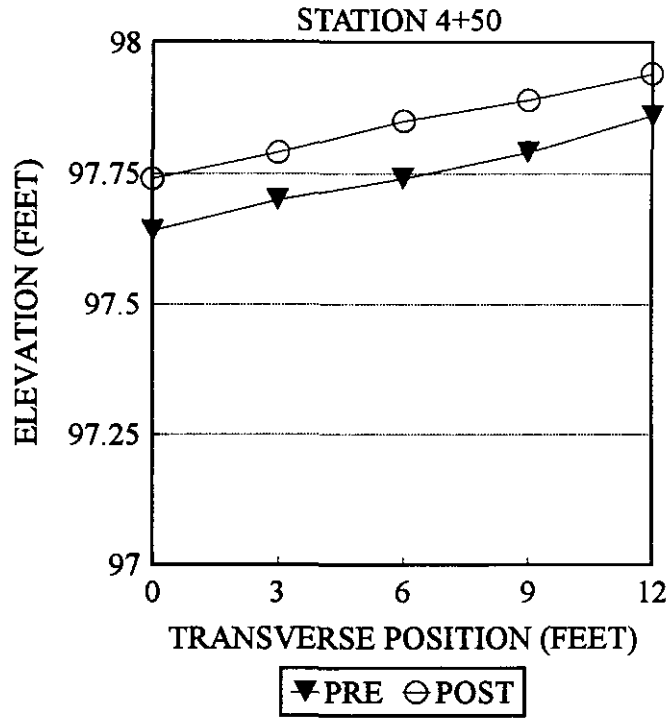

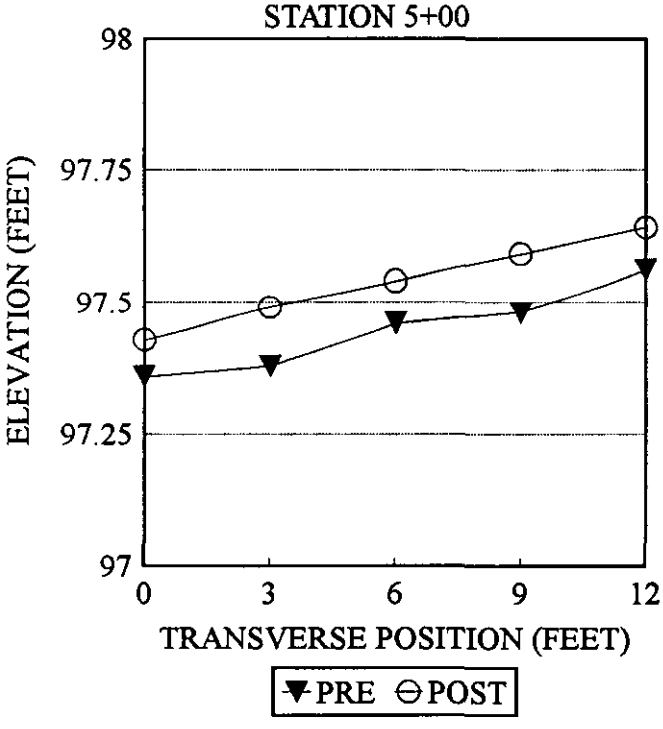

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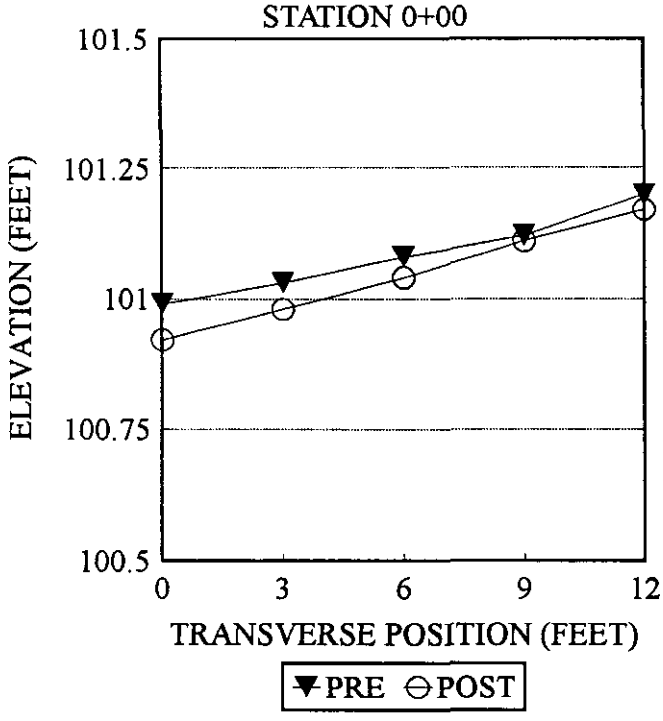

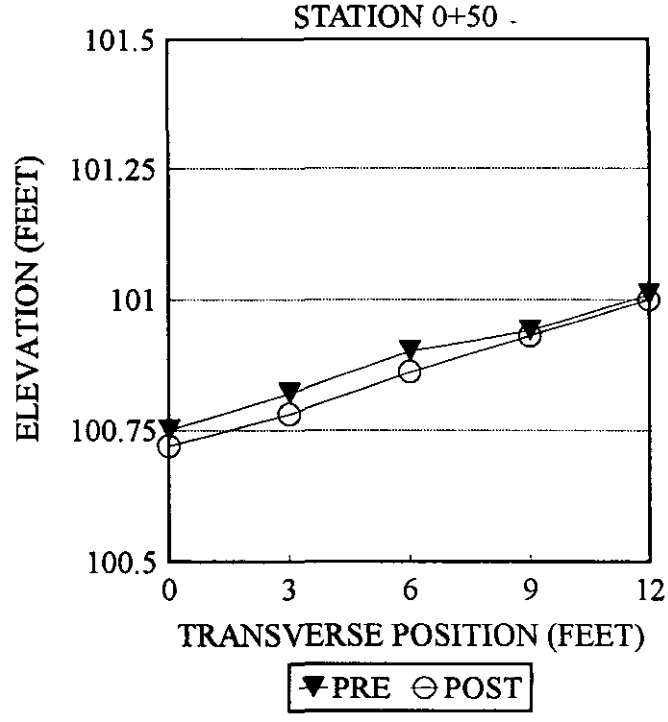

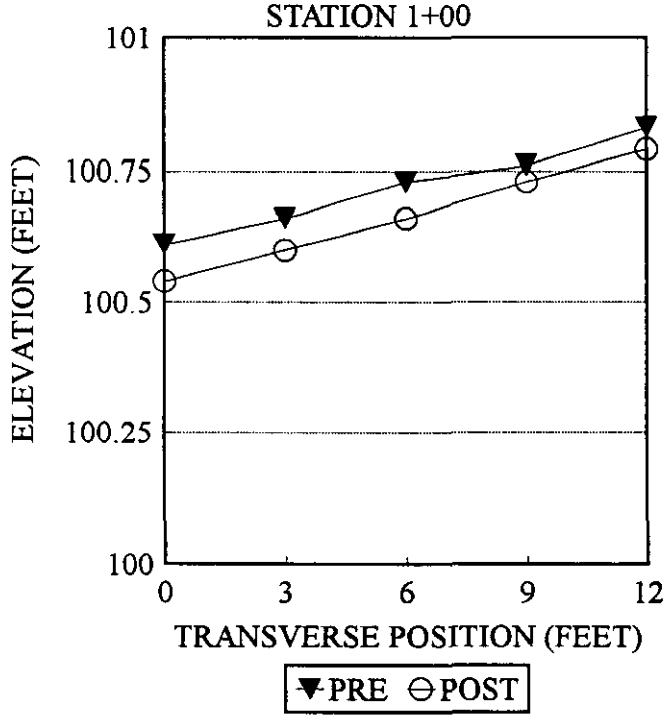

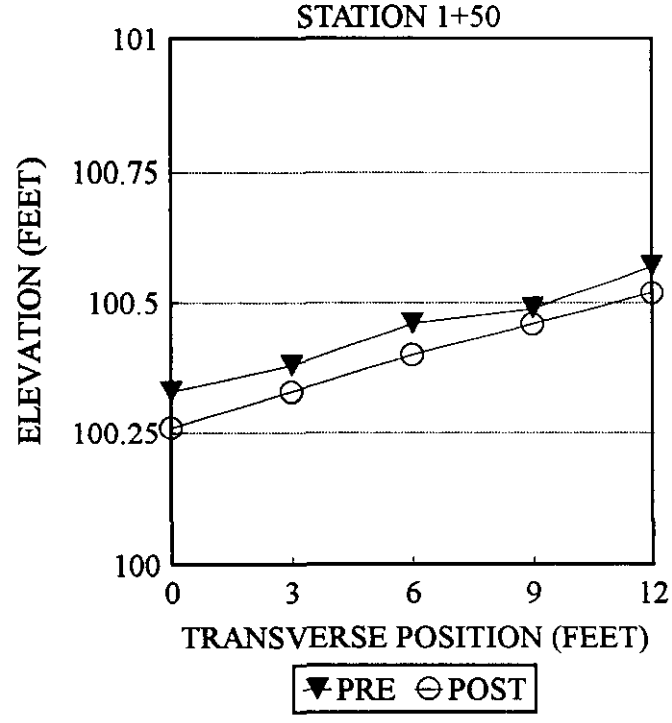

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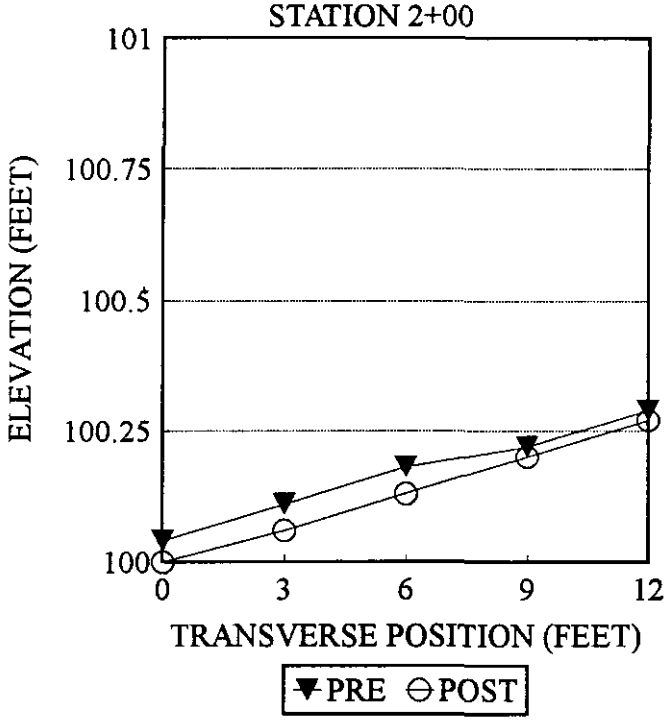

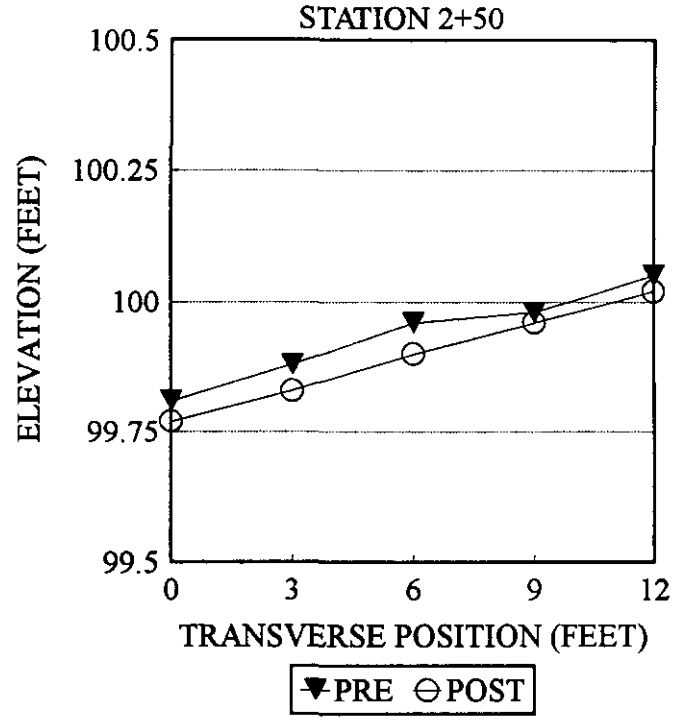

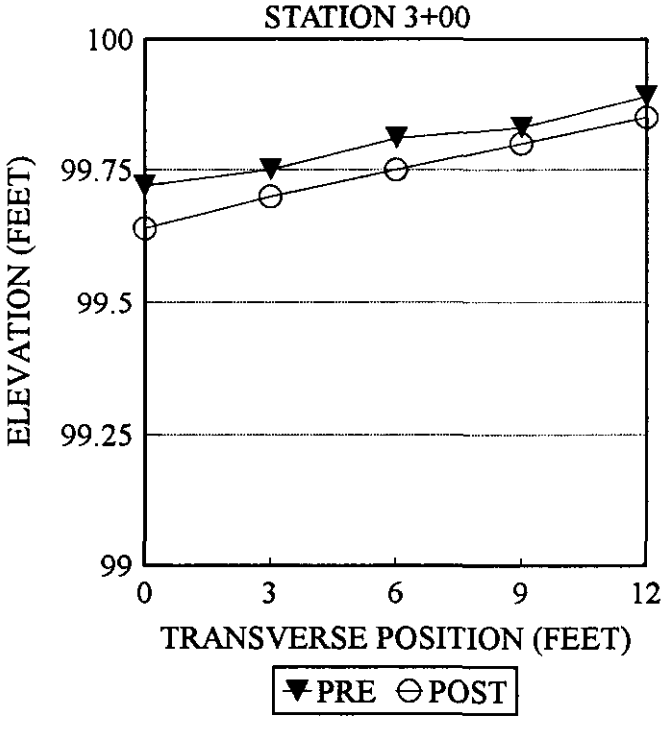

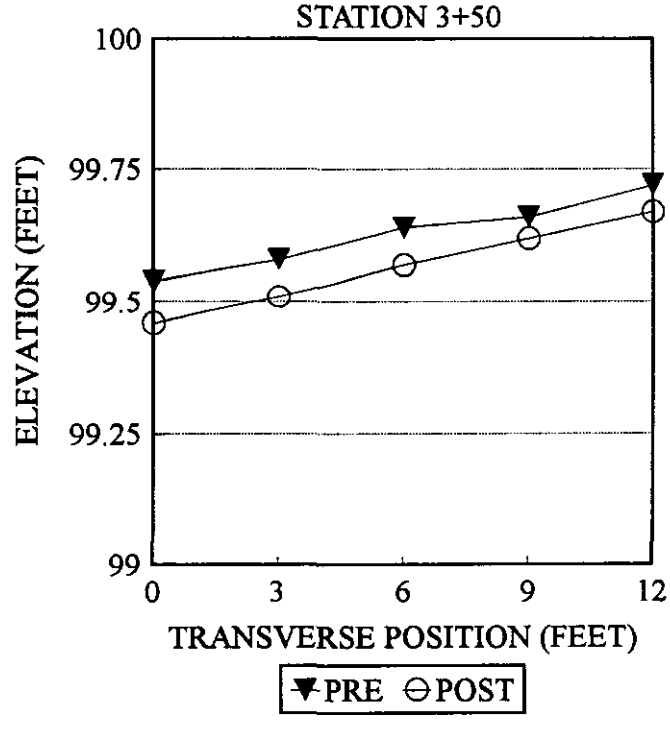

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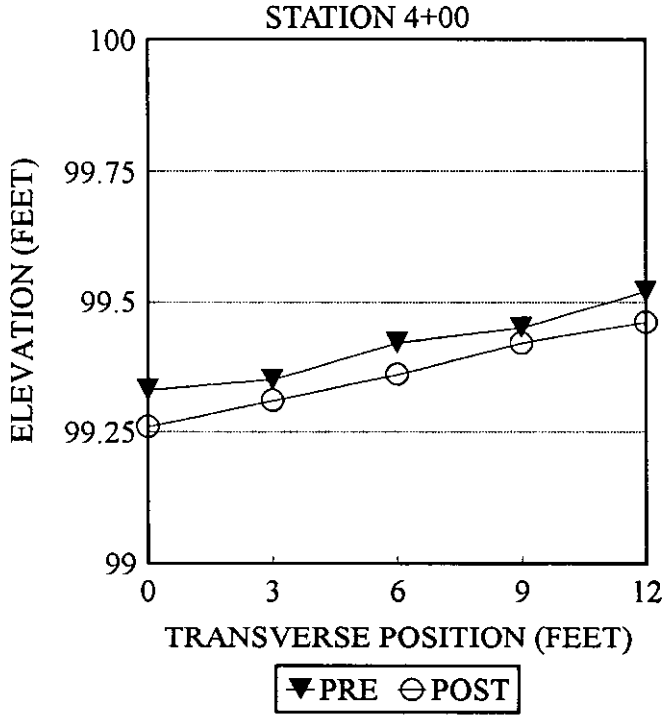

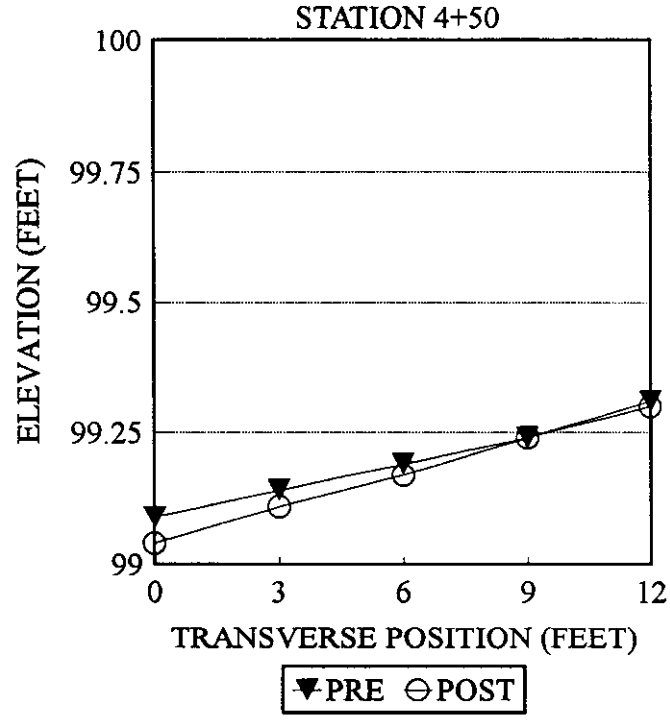

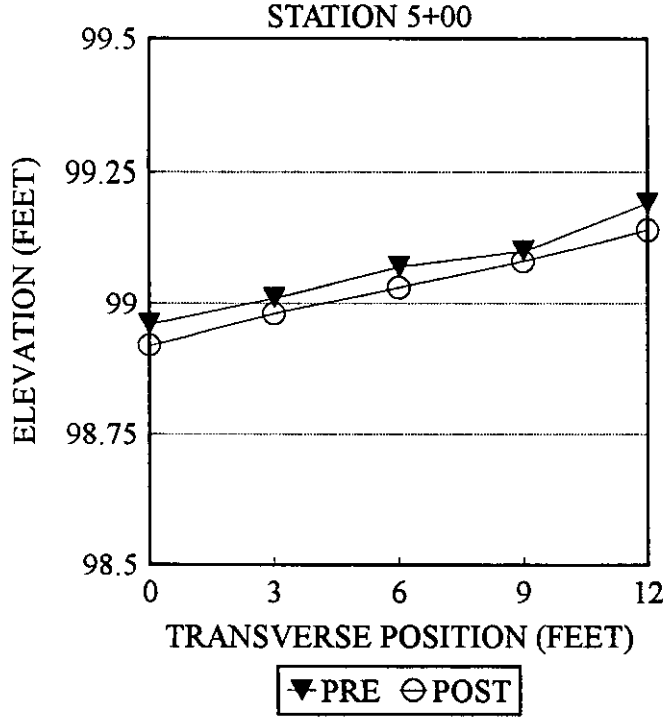

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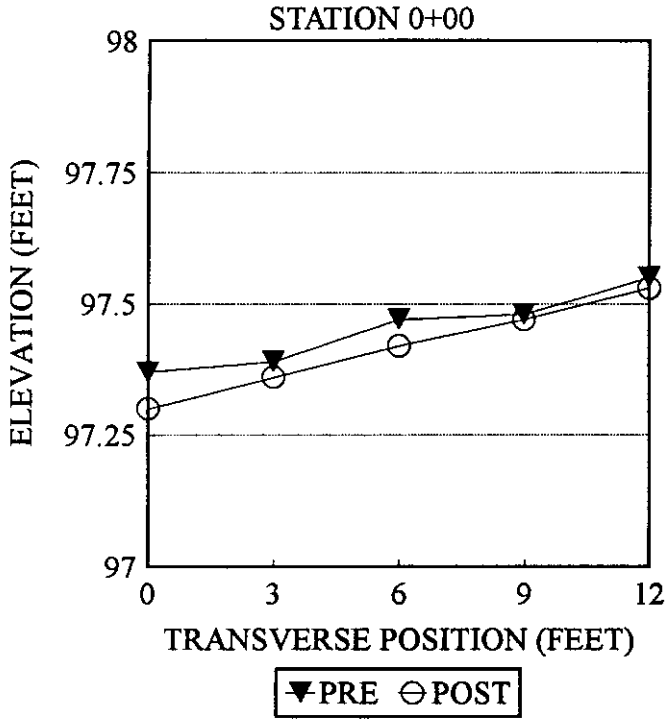

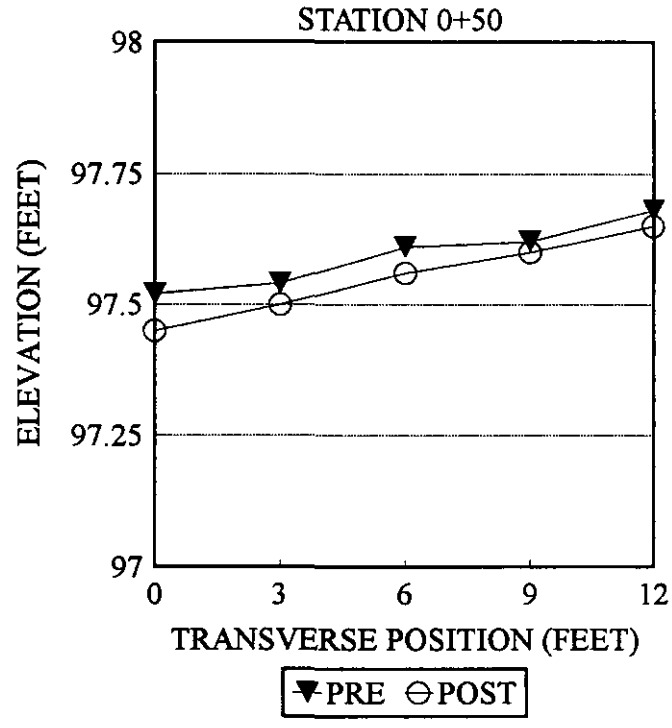

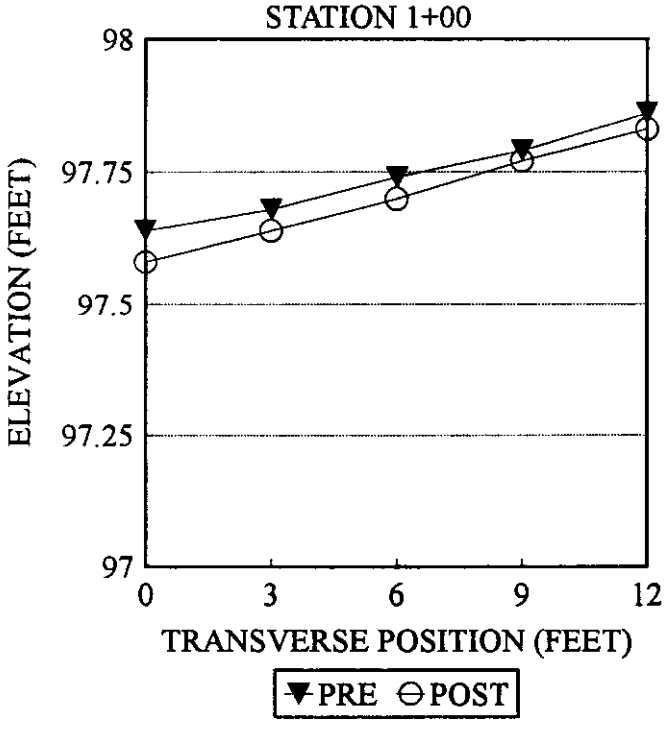

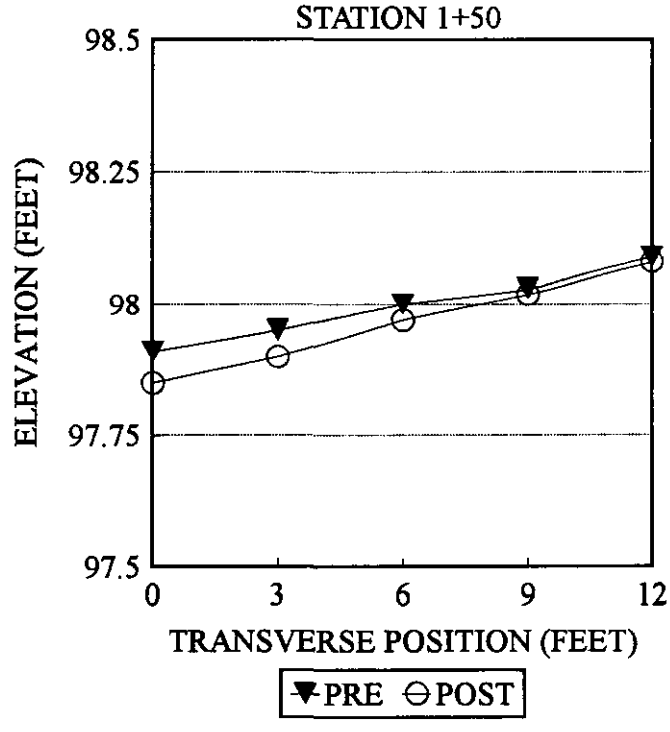

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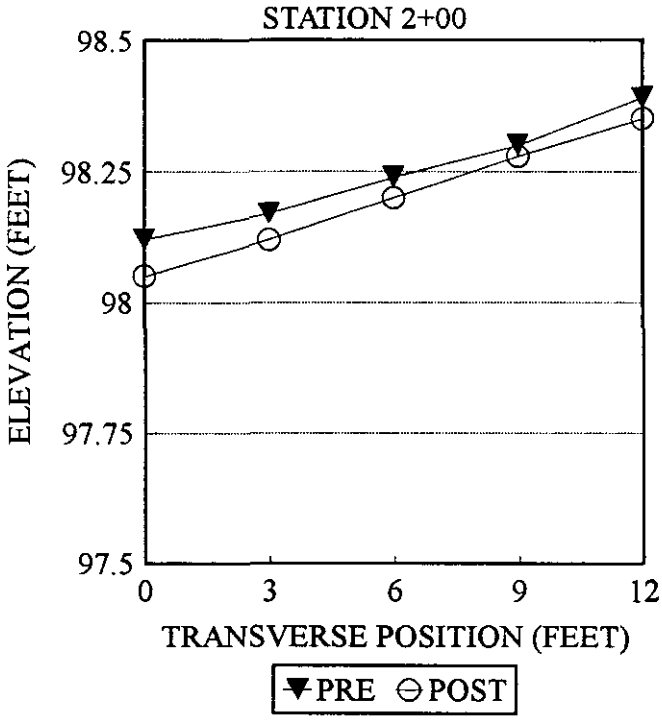
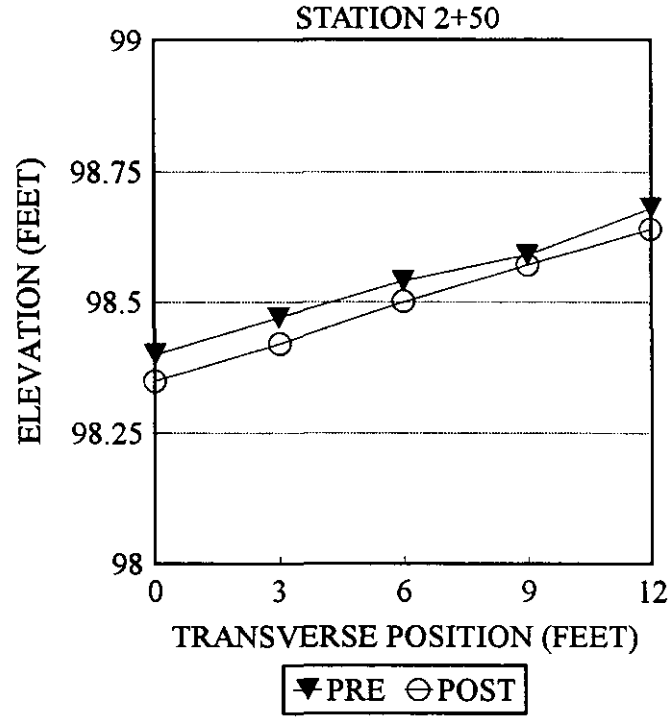
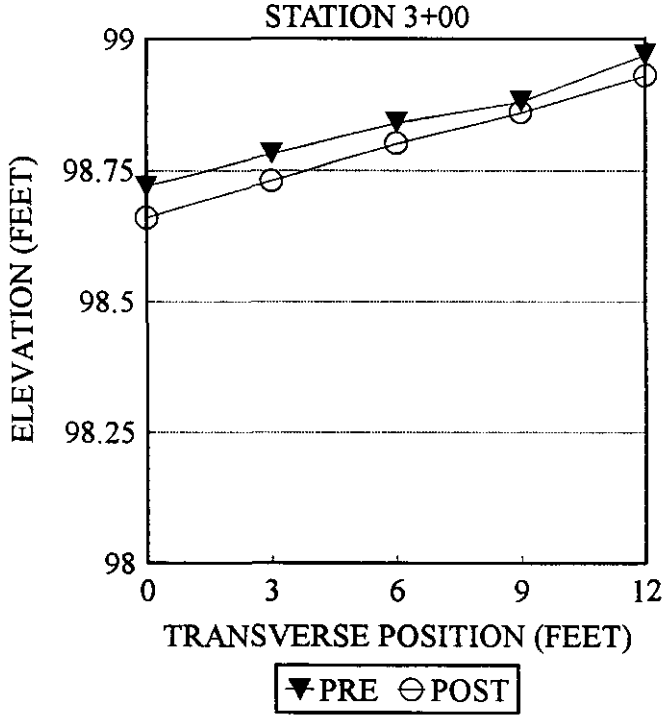
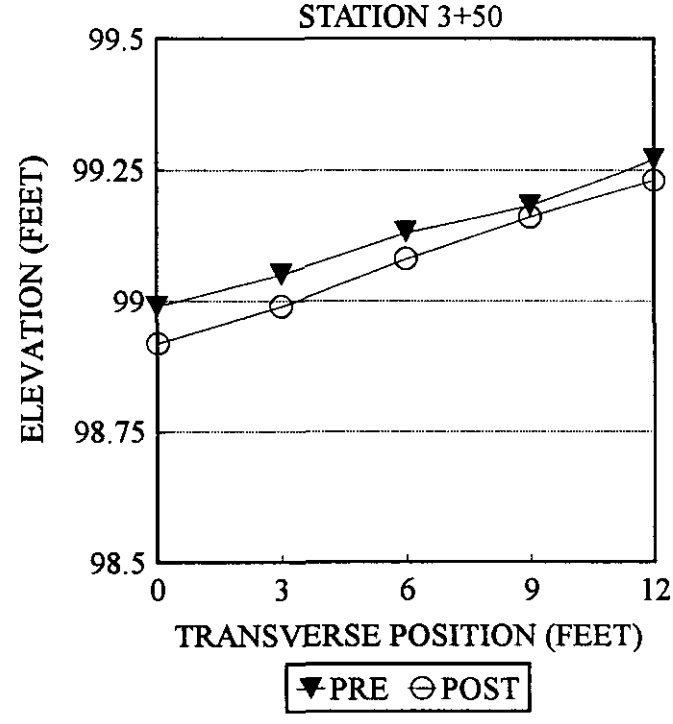
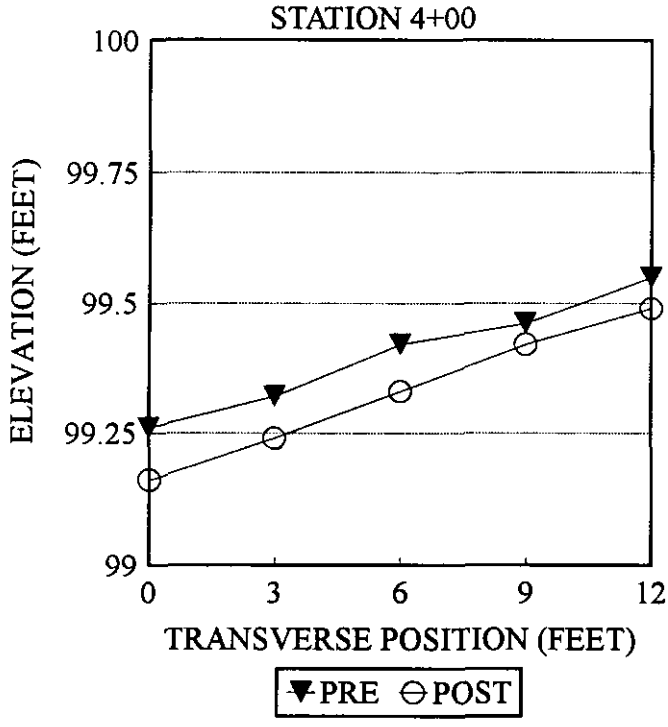


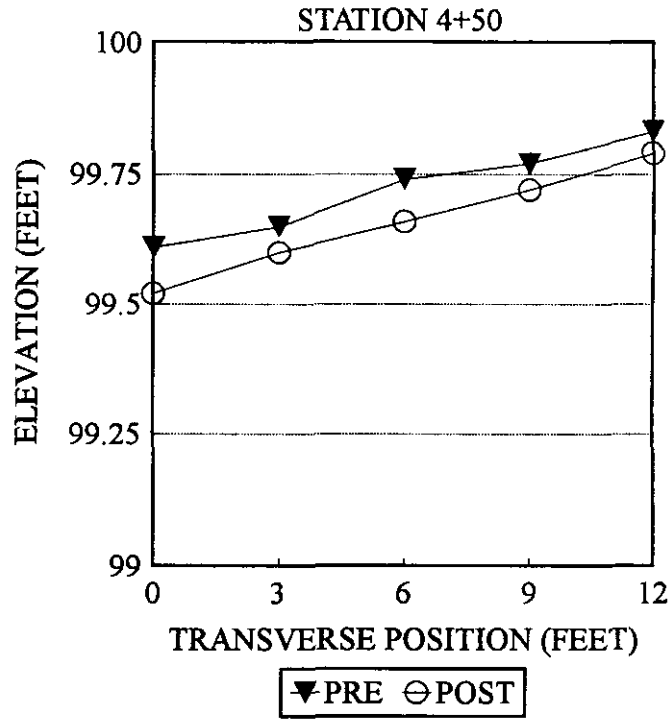


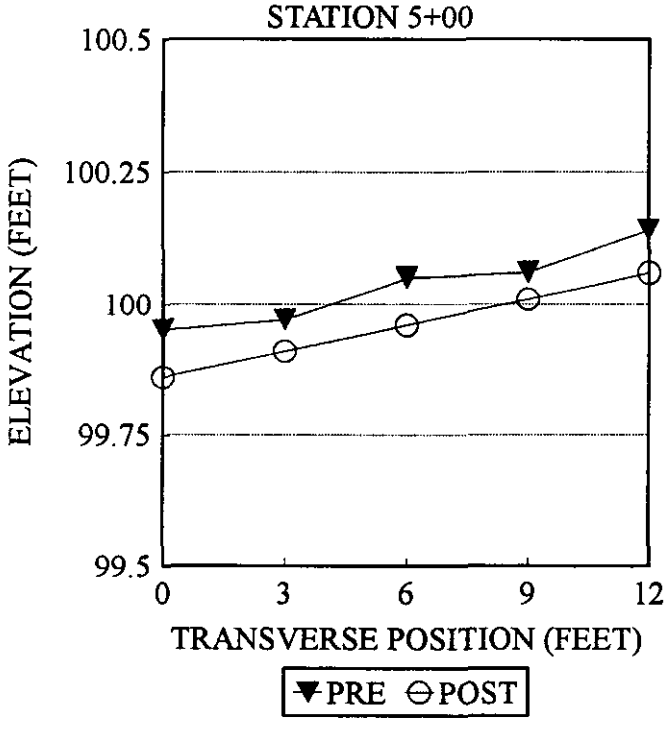




SECTION 120564







APPENDIX E

OVERLAY THICKNESSES

FLORIDA SPS-5, SECTION 120502

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										
	POST										
0+50	PRE	99.62	1.44	99.67	2.04	99.75	2.28	99.87	2.04	99.96	2.16
	POST	99.74		99.84		99.94		100.04		100.14	
1+00	PRE	99.43	1.56	99.49	1.92	99.55	2.16	99.65	2.04	99.73	2.04
	POST	99.56		99.65		99.73		99.82		99.9	
1+50	PRE	99.24	1.68	99.29	2.04	99.34	2.28	99.43	2.04	99.49	2.16
	POST	99.38		99.46		99.53		99.6		99.67	
2+00	PRE	98.94	2.04	99.01	2.16	99.08	2.28	99.18	2.04	99.22	2.4
	POST	99.11		99.19		99.27		99.35		99.42	
2+50'	PRE	98.75	2.04	98.82	2.04	98.86	2.4	98.93	2.28	98.99	2.4
	POST	98.92		98.99		99.06		99.12		99.19	
3+00	PRE	98.58	1.8	98.63	2.04	98.69	2.28	98.76	2.28	98.86	2.04
	POST	98.73		98.8		98.88		98.95		99.03	
3+50	PRE	98.25	1.8	98.31	2.04	98.38	2.16	98.45	2.28	98.54	2.04
	POST	98.4		98.48		98.56		98.64		98.71	
4+00	PRE	97.92	1.68	97.96	2.16	98.02	2.4	98.11	2.16	98.19	2.16
	POST	98.06		98.14		98.22		98.29		98.37	
4+50	PRE	97.6	1.68	97.65	1.92	97.72	2.04	97.79	2.16	97.88	2.04
	POST	97.74		97.81		97.89		97.97		98.05	
5+00	PRE	97.33	1.56	97.39	1.8	97.45	2.04	97.52	2.16	97.61	1.92
	POST	97.46		97.54		97.62		97.7		97.77	
Avg. Thick. (in.) =			2.05								
Anticipated Thick. (in.) =			2								

FLORIDA SPS-5, SECTION 120561

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	100.96	3.12	100.97	3.6	101.02	3.6	101.05	3.72	101.1	3.6
	POST	101.22		101.27		101.32		101.36		101.4	
0+50	PRE	102.12	3.36	102.15	3.6	102.18	3.72	102.23	3.6	102.27	3.6
	POST	102.4		102.45		102.49		102.53		102.57	
1+00	PRE	103.17	3.84	103.21	3.96	103.24	4.08	103.29	3.96	103.37	3.36
	POST	103.49		103.54		103.58		103.62		103.65	
1+50	PRE	104.31	3.6	104.34	3.84	104.38	3.84	104.43	3.84	104.5	3.48
	POST	104.61		104.66		104.7		104.75		104.79	
2+00	PRE	105.51	3.48	105.54	3.72	105.57	3.84	105.63	3.48	105.67	3.48
	POST	105.8		105.85		105.89		105.92		105.96	
2+50	PRE	106.72	3.36	106.74	3.48	106.75	3.84	106.78	3.96	106.85	3.36
	POST	107		107.03		107.07		107.11		107.13	
3+00	PRE	107.82	3.48	107.86	3.48	107.85	4.08	107.88	4.08	107.93	3.84
	POST	108.11		108.15		108.19		108.22		108.25	
3+50	PRE	108.86	3.36	108.87	3.72	108.89	3.84	108.93	3.84	108.97	3.72
	POST	109.14		109.18		109.21		109.25		109.28	
4+00	PRE	109.82	3.6	109.85	3.84	109.89	3.84	109.93	3.96	110.01	3.48
	POST	110.12		110.17		110.21		110.26		110.3	
4+50	PRE	110.78	3.12	110.81	3.36	110.86	3.36	110.91	3.24	110.97	3
	POST	111.04		111.09		111.14		111.18		111.22	
5+00	PRE	111.5	3.48	111.53	3.84	111.58	3.84	111.64	3.72	111.74	3.24
	POST	111.79		111.85		111.9		111.95		112.01	
Avg. Thick. (in.) =			3.63								
Anticipated Thick. (in.) =			3.5								

FLORIDA SPS-5, SECTION 120503

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	102.36	5.40	102.46	5.04	102.52	5.40	102.61	5.16	102.68	5.16
	POST	102.81		102.88		102.97		103.04		103.11	
0+50	PRE	102.25	5.28	102.31	5.40	102.36	5.64	102.42	5.76	102.50	5.64
	POST	102.69		102.76		102.83		102.90		102.97	
1+00	PRE	101.98	5.64	102.04	5.76	102.10	5.76	102.18	5.52	102.25	5.40
	POST	102.45		102.52		102.58		102.64		102.70	
1+50	PRE	101.56	5.28	101.64	5.28	101.68	5.52	101.75	5.40	101.81	5.52
	POST	102.00		102.08		102.14		102.20		102.27	
2+00	PRE	101.08	5.16	101.12	5.52	101.18	5.76	101.25	5.64	101.31	5.88
	POST	101.51		101.58		101.66		101.72		101.80	
2+50	PRE	100.42	4.92	100.49	5.28	100.57	5.40	100.68	5.16	100.74	5.52
	POST	100.83		100.93		101.02		101.11		101.20	
3+00	PRE	99.72	4.68	99.78	5.04	99.85	5.28	99.94	5.28	100.03	5.16
	POST	100.11		100.20		100.29		100.38		100.46	
3+50	PRE	98.95	5.16	99.00	5.40	99.08	5.40	99.14	5.52	99.21	5.64
	POST	99.38		99.45		99.53		99.60		99.68	
4+00	PRE	98.14	5.04	98.20	5.04	98.24	5.28	98.30	5.28	98.35	5.40
	POST	98.56		98.62		98.68		98.74		98.80	
4+50	PRE	97.10	5.04	97.15	5.28	97.22	5.16	97.28	5.28	97.36	5.16
	POST	97.52		97.59		97.65		97.72		97.79	
5+00	PRE	96.00	4.80	96.12	4.44	96.15	5.04	96.21	5.28	96.29	5.16
	POST	96.40		96.49		96.57		96.65		96.72	
Avg. Thick. (in.) =			5.32								
Anticipated Thick. (in.) =			5.00								

FLORIDA SPS-5, SECTION 120508

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	107.12	6.72	107.19	6.84	107.24	7.08	107.31	7.08	107.36	7.32
	POST	107.68		107.76		107.83		107.9		107.97	
0+50	PRE	106.27	6.72	106.33	6.72	106.35	7.2	106.42	6.96	106.48	6.84
	POST	106.83		106.89		106.95		107		107.05	
1+00	PRE	105.5	6.24	105.55	6.6	105.59	7.08	105.68	6.96	105.74	7.2
	POST	106.02		106.1		106.18		106.26		106.34	
1+50	PRE	104.86	6.36	104.91	6.84	104.97	7.2	105.04	7.32	105.14	7.08
	POST	105.39		105.48		105.57		105.65		105.73	
2+00	PRE	104.37	6.36	104.44	6.96	104.52	6.96	104.62	6.84	104.71	6.6
	POST	104.9		105.02		105.1		105.19		105.26	
2+50	PRE	104.14	6.96	104.19	7.32	104.26	7.2	104.32	7.32	104.37	7.44
	POST	104.72		104.8		104.86		104.93		104.99	
3+00	PRE	104.1	6.6	104.16	6.72	104.17	7.44	104.25	7.32	104.31	7.32
	POST	104.65		104.72		104.79		104.86		104.92	
3+50	PRE	104.17	7.32	104.23	7.2	104.28	7.44	104.35	7.32	104.41	7.32
	POST	104.78		104.83		104.9		104.96		105.02	
4+00	PRE	104.52	7.08	104.58	7.2	104.65	7.08	104.71	7.2	104.76	7.44
	POST	105.11		105.18		105.24		105.31		105.38	
4+50	PRE	105.02	7.32	105.09	7.2	105.13	7.32	105.19	7.2	105.24	7.2
	POST	105.63		105.69		105.74		105.79		105.84	
5+00	PRE	105.43	7.2	105.5	7.32	105.54	7.44	105.59	7.44	105.65	7.2
	POST	106.03		106.11		106.16		106.21		106.25	
Avg. Thick. (in.) =			7.08								
Anticipated Thick. (in.) =			7								

FLORIDA SPS-5, SECTION 120565

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	98.15	6.00	98.09	5.88	98.05	5.76	98.00	5.40	97.94	5.28
	POST	98.65		98.58		98.53		98.45		98.38	
0+50	PRE	98.60	5.88	98.54	5.88	98.48	5.88	98.43	5.64	98.35	5.76
	POST	99.09		99.03		98.97		98.90		98.83	
1+00	PRE	99.01	5.40	98.97	5.40	98.92	5.40	98.88	5.40	98.83	5.40
	POST	99.46		99.42		99.37		99.33		99.28	
1+50	PRE	99.40	5.52	99.37	5.40	99.31	5.64	99.27	5.64	99.25	5.28
	POST	99.86		99.82		99.78		99.74		99.69	
2+00	PRE	99.68	5.28	99.63	5.52	99.58	5.52	99.55	5.28	99.51	5.16
	POST	100.12		100.09		100.04		99.99		99.94	
2+50	PRE	99.71	5.88	99.72	5.40	99.68	5.52	99.66	5.28	99.62	5.28
	POST	100.20		100.17		100.14		100.10		100.06	
3+00	PRE	99.70	5.76	99.73	5.16	99.70	5.40	99.68	5.40	99.65	5.52
	POST	100.18		100.16		100.15		100.13		100.11	
3+50	PRE	99.61	5.64	99.64	5.52	99.67	5.40	99.67	5.64	99.67	5.76
	POST	100.08		100.10		100.12		100.14		100.15	
4+00	PRE	99.43	5.88	99.49	5.64	99.53	5.64	99.57	5.64	99.60	5.64
	POST	99.92		99.96		100.00		100.04		100.07	
4+50	PRE	99.29	5.04	99.34	5.16	99.39	5.16	99.43	5.28	99.45	5.52
	POST	99.71		99.77		99.82		99.87		99.91	
5+00	PRE	99.03	5.64	99.10	5.40	99.14	5.52	99.18	5.52	99.20	5.88
	POST	99.50		99.55		99.60		99.64		99.69	
Avg. Thick. (in.) =			5.52								
Anticipated Thick. (in.) =			5.50								

FLORIDA SPS-5, SECTION 120509

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	100.45	3.72	100.50	3.84	100.55	4.08	100.62	4.08	100.69	3.96
	POST	100.76		100.82		100.89		100.96		101.02	
0+50	PRE	99.40	4.08	99.47	3.96	99.53	4.20	99.61	4.08	99.65	4.32
	POST	99.74		99.80		99.88		99.95		100.01	
1+00	PRE	98.38	4.32	98.47	4.08	98.54	4.08	99.62	-8.04	99.68	-7.80
	POST	98.74		98.81		98.88		98.95		99.03	
1+50	PRE	97.48	3.96	97.56	3.96	97.62	4.20	97.71	4.20	97.79	4.08
	POST	97.81		97.89		97.97		98.06		98.13	
2+00	PRE	96.60	3.36	96.66	3.60	96.71	4.08	96.81	3.84	96.89	3.72
	POST	96.88		96.96		97.05		97.13		97.20	
2+50	PRE	95.61	3.96	95.70	3.96	95.80	3.84	95.88	3.84	95.95	3.96
	POST	95.94		96.03		96.12		96.20		96.28	
3+00	PRE	94.68	4.32	94.77	4.20	94.84	4.20	94.91	4.20	94.97	4.32
	POST	95.04		95.12		95.19		95.26		95.33	
3+50	PRE	93.82	3.84	93.85	4.44	93.91	4.32	93.99	4.20	94.05	4.08
	POST	94.14		94.22		94.27		94.34		94.39	
4+00	PRE	92.93	4.08	93.02	3.84	93.06	4.20	93.14	3.96	93.20	4.08
	POST	93.27		93.34		93.41		93.47		93.54	
4+50	PRE	92.06	4.08	92.15	4.08	92.23	4.08	92.32	3.84	92.39	3.84
	POST	92.40		92.49		92.57		92.64		92.71	
5+00	PRE	91.21	3.96	91.31	3.72	91.38	3.84	91.46	3.96	91.52	4.08
	POST	91.54		91.62		91.70		91.79		91.86	
Avg. Thick. (in.) =			3.59								
Anticipated Thick. (in.) =			4.00								

FLORIDA SPS-5, SECTION 120506

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	97.82	3.84	97.91	3.84	97.95	4.20	98.05	3.84	98.10	4.08
	POST	98.14		98.23		98.30		98.37		98.44	
0+50	PRE	98.07	4.08	98.17	3.60	98.21	4.20	98.27	4.20	98.35	4.08
	POST	98.41		98.47		98.56		98.62		98.69	
1+00	PRE	98.46	4.20	98.53	4.32	98.58	4.20	98.65	4.08	98.70	4.20
	POST	98.81		98.89		98.93		98.99		99.05	
1+50	PRE	98.90	4.44	98.96	4.32	98.99	4.44	99.07	4.20	99.11	4.20
	POST	99.27		99.32		99.36		99.42		99.46	
2+00	PRE	99.45	4.08	99.50	4.08	99.54	4.32	99.59	4.20	99.64	4.20
	POST	99.79		99.84		99.90		99.94		99.99	
2+50	PRE	100.07	5.04	100.22	4.20	100.30	3.96	100.35	4.20	100.42	4.08
	POST	100.49		100.57		100.63		100.70		100.76	
3+00	PRE	101.00	4.08	101.07	4.08	101.13	4.08	101.19	4.20	101.25	4.08
	POST	101.34		101.41		101.47		101.54		101.59	
3+50	PRE	101.82	4.08	101.90	4.08	101.96	4.20	102.05	3.84	102.12	3.84
	POST	102.16		102.24		102.31		102.37		102.44	
4+00	PRE	102.75	4.08	102.82	3.84	102.87	3.84	102.92	3.84	102.94	4.08
	POST	103.09		103.14		103.19		103.24		103.28	
4+50	PRE	103.72	3.36	103.78	3.24	103.83	3.36	103.89	3.36	103.93	3.60
	POST	104.00		104.05		104.11		104.17		104.23	
5+00	PRE	104.60	3.60	104.68	3.60	104.72	3.84	104.80	3.60	104.86	3.60
	POST	104.90		104.98		105.04		105.10		105.16	
Avg. Thick. (in.) =			4.01								
Anticipated Thick. (in.) =			4.00								

FLORIDA SPS-5, SECTION 120566

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	100.80	5.40	100.88	5.04	100.93	5.04	100.99	5.04	101.03	5.16
	POST	101.25		101.30		101.35		101.41		101.46	
0+50	PRE	101.13	5.88	101.20	5.52	101.25	5.40	101.31	5.28	101.37	5.04
	POST	101.62		101.66		101.70		101.75		101.79	
1+00	PRE	101.32	5.52	101.39	5.40	101.46	5.28	101.54	4.92	101.59	5.04
	POST	101.78		101.84		101.90		101.95		102.01	
1+50	PRE	101.39	5.28	101.45	5.28	101.51	5.40	101.60	5.04	101.66	5.04
	POST	101.83		101.89		101.96		102.02		102.08	
2+00	PRE	101.37	5.52	101.45	5.40	101.51	5.40	101.60	5.16	101.67	4.92
	POST	101.83		101.90		101.96		102.03		102.08	
2+50	PRE	101.24	5.28	101.35	5.04	101.42	5.28	101.51	5.16	101.60	5.04
	POST	101.68		101.77		101.86		101.94		102.02	
3+00	PRE	101.14	5.52	101.25	5.16	101.33	5.16	101.43	4.92	101.50	4.92
	POST	101.60		101.68		101.76		101.84		101.91	
3+50	PRE	101.08	5.40	101.14	5.52	101.20	5.52	101.29	5.04	101.33	5.28
	POST	101.53		101.60		101.66		101.71		101.77	
4+00	PRE	100.70	5.40	100.78	5.28	100.82	5.64	100.90	5.40	100.95	5.40
	POST	101.15		101.22		101.29		101.35		101.40	
4+50	PRE	100.24	5.40	100.31	5.28	100.37	5.52	100.45	5.28	100.49	5.64
	POST	100.69		100.75		100.83		100.89		100.96	
5+00	PRE	99.74	5.76	99.82	5.76	99.88	5.76	99.96	5.64	100.03	5.76
	POST	100.22		100.30		100.36		100.43		100.51	

Avg. Thick. (in.) = 5.04
Anticipated Thick. (in.) = 5.50

FLORIDA SPS-5, SECTION 120507

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	102.17	6.6	102.25	6.6	102.32	6.72	102.44	6.36	102.54	6.12
	POST	102.72		102.8		102.88		102.97		103.05	
0+50	PRE	101.58	6.72	101.7	6.6	101.8	6.48	101.91	6.48	102.01	6.24
	POST	102.14		102.25		102.34		102.45		102.53	
1+00	PRE	101.26	6.72	101.39	6.24	101.48	6.36	101.59	6.12	101.67	6.48
	POST	101.82		101.91		102.01		102.1		102.21	
1+50	PRE	101.08	6.84	101.21	6.24	101.28	6.48	101.38	6.24	101.46	6.36
	POST	101.65		101.73		101.82		101.9		101.99	
2+00	PRE	101.03	6.72	101.13	6.36	101.2	6.48	101.29	6.24	101.36	6.24
	POST	101.59		101.66		101.74		101.81		101.88	
2+50	PRE	100.99	6.6	101.08	6.48	101.16	6.6	101.24	6.6	101.32	6.72
	POST	101.54		101.62		101.71		101.79		101.88	
3+00	PRE	101.07	6.6	101.14	6.72	101.21	6.84	101.31	6.48	101.38	6.6
	POST	101.62		101.7		101.78		101.85		101.93	
3+50	PRE	101.22	6.48	101.33	6.36	101.38	6.72	101.47	6.6	101.57	6.36
	POST	101.76		101.86		101.94		102.02		102.1	
4+00	PRE	101.5	6.24	101.6	6.12	101.65	6.6	101.74	6.48	101.82	6.6
	POST	102.02		102.11		102.2		102.28		102.37	
4+50	PRE	101.79	6.96	101.88	6.84	101.94	6.96	102.04	6.6	102.15	6.36
	POST	102.37		102.45		102.52		102.59		102.68	
5+00	PRE	102.23	7.2	102.33	6.96	102.38	7.2	102.46	7.08	102.53	7.08
	POST	102.83		102.91		102.98		103.05		103.12	
Avg. Thick. (in.) =			6.57								
Anticipated Thick. (in.) =			7								

FLORIDA SPS-5, SECTION 120504

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	95.48	4.32	95.56	4.56	95.60	5.16	95.70	4.92	95.77	4.92
	POST	95.84		95.94		96.03		96.11		96.18	
0+50	PRE	95.85	4.08	95.93	4.44	95.99	4.92	96.11	4.68	96.20	4.92
	POST	96.19		96.30		96.40		96.50		96.61	
1+00	PRE	96.28	4.08	96.35	4.32	96.41	4.68	96.52	4.68	96.61	4.68
	POST	96.62		96.71		96.80		96.91		97.00	
1+50	PRE	96.71	4.80	96.78	4.92	96.82	5.28	96.92	4.92	96.99	4.80
	POST	97.11		97.19		97.26		97.33		97.39	
2+00	PRE	97.20	4.92	97.25	4.92	97.29	5.16	97.37	4.92	97.42	5.04
	POST	97.61		97.66		97.72		97.78		97.84	
2+50	PRE	97.67	5.16	97.72	5.28	97.76	5.52	97.85	5.04	97.93	4.92
	POST	98.10		98.16		98.22		98.27		98.34	
3+00	PRE	98.12	5.04	98.18	5.04	98.22	5.16	98.30	4.92	98.35	5.04
	POST	98.54		98.60		98.65		98.71		98.77	
3+50	PRE	98.54	4.44	98.59	4.68	98.62	5.16	98.72	4.80	98.78	4.80
	POST	98.91		98.98		99.05		99.12		99.18	
4+00	PRE	98.92	4.56	98.99	4.56	99.03	4.92	99.11	4.80	99.17	4.92
	POST	99.30		99.37		99.44		99.51		99.58	
4+50	PRE	99.34	4.68	99.41	4.68	99.45	5.16	99.56	4.68	99.61	5.04
	POST	99.73		99.80		99.88		99.95		100.03	
5+00	PRE	99.34	9.24	99.80	4.56	99.84	5.16	99.95	4.68	100.03	4.80
	POST	100.11		100.18		100.27		100.34		100.43	
Avg. Thick. (in.) =			4.92								
Anticipated Thick. (in.) =			5.00								

FLORIDA SPS-5, SECTION 120562

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	98.49	3.12	98.56	3.36	98.62	3.72	98.72	3.48	98.80	3.48
	POST	98.75		98.84		98.93		99.01		99.09	
0+50	PRE	98.61	2.88	98.65	3.36	98.69	3.72	98.78	3.48	98.85	3.48
	POST	98.85		98.93		99.00		99.07		99.14	
1+00	PRE	98.57	3.12	98.65	3.12	98.69	3.60	98.78	3.36	98.84	3.60
	POST	98.83		98.91		98.99		99.06		99.14	
1+50	PRE	98.52	2.76	98.58	3.00	98.63	3.48	98.72	3.48	98.79	3.60
	POST	98.75		98.83		98.92		99.01		99.09	
2+00	PRE	98.33	3.12	98.42	3.24	98.48	3.36	98.59	3.12	98.65	3.36
	POST	98.59		98.69		98.76		98.85		98.93	
2+50	PRE	98.08	3.00	98.15	3.12	98.20	3.48	98.28	3.36	98.37	3.24
	POST	98.33		98.41		98.49		98.56		98.64	
3+00	PRE	97.82	2.88	97.87	3.48	97.91	3.60	97.98	3.36	98.02	3.72
	POST	98.06		98.16		98.21		98.26		98.33	
3+50	PRE	97.50	3.12	97.55	3.24	97.54	4.20	97.63	3.72	97.67	3.72
	POST	97.76		97.82		97.89		97.94		97.98	
4+00	PRE	97.12	3.48	97.20	3.36	97.25	3.72	97.32	3.36	97.38	3.60
	POST	97.41		97.48		97.56		97.60		97.68	
4+50	PRE	96.81	3.36	96.88	3.24	96.92	3.60	96.99	3.60	97.05	3.60
	POST	97.09		97.15		97.22		97.29		97.35	
5+00	PRE	96.46	3.36	96.54	3.24	96.60	3.36	96.69	3.12	96.74	3.48
	POST	96.74		96.81		96.88		96.95		97.03	

Avg. Thick. (in.) = 3.38
Anticipated Thick. (in.) = 3.50

FLORIDA SPS-5, SECTION 120505

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	100.47	1.56	100.53	1.56	100.56	1.80	100.61	2.04	100.65	2.16
	POST	100.60		100.66		100.71		100.78		100.83	
0+50	PRE	100.07	2.04	100.13	2.16	100.16	2.40	100.24	2.04	100.30	2.04
	POST	100.24		100.31		100.36		100.41		100.47	
1+00	PRE	99.74	1.80	99.79	1.92	99.83	2.16	99.90	2.16	99.96	2.04
	POST	99.89		99.95		100.01		100.08		100.13	
1+50	PRE	99.39	2.04	99.48	1.68	99.51	2.04	99.56	2.16	99.61	2.16
	POST	99.56		99.62		99.68		99.74		99.79	
2+00	PRE	99.09	2.16	99.16	1.92	99.20	2.04	99.25	2.04	99.30	2.04
	POST	99.27		99.32		99.37		99.42		99.47	
2+50	PRE	98.80	2.16	98.88	1.80	98.91	2.04	98.96	2.04	98.00	14.04
	POST	98.98		99.03		99.08		99.13		99.17	
3+00	PRE	98.50	2.04	98.56	1.92	98.59	2.04	98.65	1.92	98.68	2.16
	POST	98.67		98.72		98.76		98.81		98.86	
3+50	PRE	98.21	2.04	98.27	1.92	98.29	2.04	98.33	2.04	98.37	1.92
	POST	98.38		98.43		98.46		98.50		98.53	
4+00	PRE	97.91	1.92	97.97	1.80	98.00	2.04	98.40	-2.16	98.09	2.04
	POST	98.07		98.12		98.17		98.22		98.26	
4+50	PRE	97.57	2.04	97.63	1.92	97.68	2.04	97.73	1.92	97.75	2.28
	POST	97.74		97.79		97.85		97.89		97.94	
5+00	PRE	97.30	1.56	97.35	1.68	97.38	1.92	97.44	1.80	97.48	1.92
	POST	97.43		97.49		97.54		97.59		97.64	
Avg. Thick. (in.) =			2.13								
Anticipated Thick. (in.) =			2.00								

FLORIDA SPS-5, SECTION 120563

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	100.76	1.92	100.81	2.04	100.85	2.28	100.93	2.16	100.99	2.16
	POST	100.92		100.98		101.04		101.11		101.17	
0+50	PRE	100.53	2.28	100.61	2.04	100.65	2.52	100.74	2.28	100.81	2.28
	POST	100.72		100.78		100.86		100.93		101.00	
1+00	PRE	100.38	1.92	100.44	1.92	100.46	2.40	100.55	2.16	100.62	2.04
	POST	100.54		100.60		100.66		100.73		100.79	
1+50	PRE	100.11	1.80	100.18	1.80	100.22	2.16	100.29	2.04	100.35	2.04
	POST	100.26		100.33		100.40		100.46		100.52	
2+00	PRE	99.84	1.92	99.91	1.80	99.97	1.92	100.04	1.92	100.09	2.16
	POST	100.00		100.06		100.13		100.20		100.27	
2+50	PRE	99.58	2.28	99.67	1.92	99.72	2.16	99.79	2.04	99.83	2.28
	POST	99.77		99.83		99.90		99.96		100.02	
3+00	PRE	99.47	2.04	99.54	1.92	99.57	2.16	99.63	2.04	99.67	2.16
	POST	99.64		99.70		99.75		99.80		99.85	
3+50	PRE	99.34	1.44	99.38	1.56	99.40	2.04	99.46	1.92	99.50	2.04
	POST	99.46		99.51		99.57		99.62		99.67	
4+00	PRE	99.11	1.80	99.16	1.80	99.20	1.92	99.26	1.92	99.30	1.92
	POST	99.26		99.31		99.36		99.42		99.46	
4+50	PRE	98.88	1.92	98.94	2.04	98.99	2.16	99.06	2.16	99.11	2.28
	POST	99.04		99.11		99.17		99.24		99.30	
5+00	PRE	98.75	2.04	98.80	2.16	98.85	2.16	98.90	2.16	98.96	2.16
	POST	98.92		98.98		99.03		99.08		99.14	
Avg. Thick. (in.) =			2.05								
Anticipated Thick. (in.) =			2.00								

FLORIDA SPS-5, SECTION 120564

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	97.76	-5.52	97.22	1.68	97.24	2.16	97.31	1.92	97.35	2.16
	POST	97.30		97.36		97.42		97.47		97.53	
0+50	PRE	97.33	1.44	97.37	1.56	97.39	2.04	97.45	1.80	97.49	1.92
	POST	97.45		97.50		97.56		97.60		97.65	
1+00	PRE	97.42	1.92	97.50	1.68	97.55	1.80	97.62	1.80	97.66	2.04
	POST	97.58		97.64		97.70		97.77		97.83	
1+50	PRE	97.70	1.80	97.77	1.56	97.81	1.92	97.87	1.80	97.91	2.04
	POST	97.85		97.90		97.97		98.02		98.08	
2+00	PRE	97.89	1.92	97.98	1.68	98.04	1.92	98.12	1.92	98.20	1.80
	POST	98.05		98.12		98.20		98.28		98.35	
2+50	PRE	98.20	1.80	98.27	1.80	98.33	2.04	98.41	1.92	98.47	2.04
	POST	98.35		98.42		98.50		98.57		98.64	
3+00	PRE	98.51	1.80	98.58	1.80	98.64	1.92	98.71	1.80	98.76	2.04
	POST	98.66		98.73		98.80		98.86		98.93	
3+50	PRE	98.77	1.80	98.86	1.56	98.92	1.92	98.99	2.04	99.04	2.28
	POST	98.92		98.99		99.08		99.16		99.23	
4+00	PRE	99.02	1.68	99.11	1.56	99.19	1.68	99.28	1.68	99.34	1.80
	POST	99.16		99.24		99.33		99.42		99.49	
4+50	PRE	99.39	1.56	99.46	1.68	99.53	1.56	99.60	1.44	99.64	1.80
	POST	99.52		99.60		99.66		99.72		99.79	
5+00	PRE	99.73	1.56	99.77	1.68	98.81	13.80	99.88	1.56	99.90	1.92
	POST	99.86		99.91		99.96		100.01		100.06	

Avg. Thick. (in.) = 1.90
Anticipated Thick. (in.) = 2.00

APPENDIX F

PHOTOGRAPHS

Photo 1. Milling Operation Prior To Overlay.
All Porous Friction Coarse Surface Was Removed Using A ROADTEC RX-68

Photo 2. The Milled Surface With Tack,
As Well As Elevation Control Marking (Yellow Paint) Designating Rod Shot Locations

Photo 3. Tacked Surface Of A Binder Lift, Including Rod Shot Control Marking Which Was Transferred Up Through To Each Lift

Photo 4. A Caterpillar AP-1200 Laydown Machine Constructs Each Successive Lift Pulling Against The Direction Of Traffic

Photo 5. Recycled Test Section 120503 (Final Binder Surface) Exhibiting Signs Of Segregation

Photo 6. An Uncompacted Surface Immediately Following The Laydown Machine (Test Section 120509)

Photo 7. The Final Surface Lift Undergoing Compaction

Photo 8. Station Identification Located In The Median At Every 50-Feet Served As An Invaluable Asset During Construction

Photo 9. Surface Condition Evaluation Prior To Evaluation Measurements

Photo 10. Surface Measurements Obtained Immediately After The Placement Of Each New Lift

Photo 11. Construction Of A Binder Lift On Test Section 120507. The Longitudinal Joint Is Staggered By 6 Inches Transversely (Marked In Orange Paint)

Photo 12. The Final Product (Facing North) US-1, Martin County, Florida