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CONSTRUCTION REPORT ON SPS-6 PROJECT
Pennsylvania Department of Transportation
State Highway Administration

Project 420600
I-80 WBL, Snowshoe, PA
Fall of 1992

Report Prepared by

North Atlantic Regional Contractor
Pavement Management Systems Limited
Under Contract DTFH 61-92-C00007

Submitted to

DEPARTMENT OF TRANSPORTATION
Federal Highway Administration
Long Term Pavement Performance Division

PAVEMENT MANAGEMENT SYSTEMS LIMITED
415 Lawrence Bell Drive Suite 3
Amherst, New York 14221

May 1995

Technical Report Documentation Page

1 Report No	2 Government Accession No	3 Recipient's Catalog No
FHWA-RD-95-		

4 Title and Subtitle	5 Report Date
Construction Report on SPS-6 Project 420600, I-80 WBL, Snowshoe, PA	May 1995
	6 Performing Organization Code

7 Author(s)	8 Performing Organization Report No
Norman Der and Dennis Morian	

9 Performing Organization Name and Address	10 Work Unit No (TRAIS)
Pavement Management Systems Limited 415 Lawrence Bell Drive, Suite 3 Amherst, New York 14221	11 Contract or Grant No DTFH-61-92-C-00007

12 Sponsoring Agency Name and Address	13 Type of Report and Period Covered
Department of Transportation Federal Highway Administration Long Term Pavement Performance Division 6300 Georgetown Pike, Room F215 McLean, Virginia 22101-2296	14 Sponsoring Agency Code

15 Supplementary Notes

The SPS-6 Project 420600 is a part of the Specific Pavement Studies Experiment SPS-6, Rehabilitation of Jointed Portland Cement Concrete Pavements It is located in the Wet-Freeze environment and the jointed plain concrete pavement is in poor condition The subgrade is a silt and the 10" PCC pavement with joints at 61 5 ft , lies on a 9" thick crushed limestone subbase which is mixed with clay Traffic AADT was 12,694 with 47% trucks in 1992

16 Abstract

Project 420600 is located on the west-bound driving lane of the 4-lane divided I-80, between Exits 22 and 23, near Snowshoe, Centre County, PA There are eight 500 ft long SPS-6 experiment sections and three supplemental agency test sections in the 2 45 miles construction contract The prime contractor was H R I of Bellefonte, PA and paving and construction work on these test sections took place between September 22, 1992 and October 02, 1992 Preparation of the old pavement surface consisted (a) of minimal preparation i e limited spot repairs, (b) intensive preparation i e full-depth patching, joint repair and subsealing, with or without restoration of load transfer devices, shoulder restoration, subdrainage, diamond grinding, (c) crack, break and seat, (d) rubblize, (e) saw slabs at third points Asphalt Concrete overlays in the SHRP experiment were 4" and 8" AC overlays in the supplemental test sections were 8", 9 5", and 13"

17 Key Words	18 Distribution Statement
Diamond Grinding, Break and Seat, Rubblize, Minimal and Intensive Surface Preparation, Asphalt Concrete Overlay	

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

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Introduction

The SPS-6 experiment addresses the rehabilitation of jointed Portland cement concrete pavements The project lies in the wet-freeze environment area, and falls within the fine grained subgrade soil cell of the Long Term Pavement Performance (LTPP) experiment

In addition to the eight Strategic Highway Research Program (SHRP) test sections, this project includes three supplemental sections The primary experiment includes minimum, intensive and break and seat surface preparation treatments Selected sections then received an asphalt concrete overlay of 102mm (4") or 203mm (8") The three supplemental sections included a variation in overlay thickness and base preparation, saw slabs at third points plus crack/break and seat with 203mm (8") overlay and 241mm (9 1/2") and 330mm (13") asphalt concrete overlay on rubblized concrete

The PA SHA SPS-6 project is located in the westbound travel lane of the four-lane divided roadway of I-80 near Snowshoe, Pennsylvania, between exits 22 and 23, (see Figure 1) The terrain consists of rolling hills Consequently, the test sections lie on an upward grade of about 4% The alignment is relatively straight, with areas of both cut and fill within the project One major bridge structure lies within the construction limits of the project The traffic at the time of construction was 12,694 AADT with 47% trucks

The westbound roadway consists of two 3 65m (12') wide jointed Portland cement concrete lanes with 3m (10') asphalt concrete paved shoulders on the outside, and 1 2m (4') asphalt concrete shoulders on the median side The existing pavement is 254mm (10") of Portland cement concrete pavement with 18 7m (61 5') joint spacing on 241mm (9 1/2") of clay with crushed limestone subbase on a silt subgrade The pavement exhibited extensive distress at the joints, including joint seal damage and joint spalling and faulting Photos 1 and 2 illustrate the severity of these distresses

The Pennsylvania SHRP Coordinator and LTPP contact is Mr Gary L Hoffman, PE Other key project staff for the project were

The Pennsylvania SHA LTPP Project Representative was Mr Dan Dawood, P E
The Inspector-in-Charge was Mr Russ Holden
The Construction Project Engineer was Mr Jeff Missa
The Contractor's Supervisor was Mr Larry Brungart
The Area Materials Manager was Mr William Smith from Plant 103, Curtin Gap, Bellefonte, PA 16874
The Prime Contractor was H R I Inc RD1, Box 142, Snowshoe, PA, 16874
The SHRP/LTPP North Atlantic Regional office (NARO) representatives were Mr Norman Der, Pavement Management Systems Limited (PMSL) and Mr Basel Abukhater, (PMSL)

H R I was in overall charge of the construction work Materials sampling during construction was carried out by Mr William Smith, H R I H R I 's asphalt mix plant for this project was an Aztec five ton batch mix plant It was equipped with four hot bins, mineral filler system, and six cold feeds Paving equipment included an 8 5m (28') Blawnox PF200 and a 4 3m (14') Blawnox 5101 paving machine Compaction was performed with a Bomag BW161AD 9 Megagram (10 ton) steel drum vibratory roller, a Bomag BW202AD 9 25 Megagram (10 2 ton) steel drum vibratory roller, and a Dresser S10-14A 9 Megagram (10 ton) steel wheel roller

Equipment for the various preparation treatments included concrete diamond blade saws, an asphalt distributor, a crack sealant kettle and hot air lance, a cold milling machine, a resonant pavement rubblizing machine, and a pavement breaker

The pavement rubblizing machine was a RMI PB-4 (Resonant Machines Inc , Tulsa, Oklahoma) with 229mm (9") breaker head The 6 Megagram (6 1/2 ton) breaker machine was supplied and operated by a subcontractor, Pavilion Drainage A power broom was used to control dust during milling and patching

SPS-6 General Criteria

The SPS-6 experiment is a coordinated research plan intended to produce data and performance information for a variety of rehabilitation and overlay procedures constructed to extend the life of existing jointed PCC pavements The SPS-6 project in Snowshoe consists of eight SHRP sections plus three additional test sections for the Pennsylvania Department of Transportation In accordance with the experiment requirements, three levels of pavement preparation plus routine maintenance as a control section were applied to selected test sections They are, minimal preparation, intensive preparation, and crack/break and seat

The minimal preparation level consists of routine maintenance including limited patching (filling pot holes), crack repair and sealing, and stabilization of joints

The intensive preparation level consists of several activities that may be done depending on pavement distress and condition These pavement preparations include diamond grinding, subsealing, the addition of subdrainage, joint repair and sealing, full depth patching with or without restoration of load transfer, and shoulder rehabilitation

Each test section is 152m (500') in length with the exception of the test sections that receive minimum restoration or intensive preparation and no asphalt concrete overlay These test sections are 305m (1000') long

The experiment consists of

Section 1 (420601)	- Control, routine maintenance
Section 2 (420602)	- Minimal surface preparation, no overlay
Section 3 (420603)	- Minimal surface preparation with 102mm (4") overlay
Section 4 (420604)	- Minimal surface preparation with saw and seal 102mm (4") overlay
Section 5 (420605)	- Intensive surface preparation, no overlay
Section 6 (420606)	- Intensive surface preparation with 102mm (4") overlay
Section 7 (420607)	- Crack/break and seat section with 102mm (4") overlay
Section 8 (420608)	- Crack/break and seat section with 203mm (8") overlay
Section 10 (420660)	- PENNDOT section Rubblize *section with 241mm (9 5") overlay
Section 11 (420661)	- PENNDOT section Rubblize *section with 330mm (13") overlay
Section 12 (420662)	- PENNDOT section Saw slabs at third points plus crack/break and seat section with 203mm (8") overlay

The *PENNDOT specification for pavement rubblization is provided in Appendix B The equipment used for both rubblization and crack/break and seat are addressed by this specification

The test sections were laid out to minimize traffic disruption on this heavily traveled east-west highway Test Sections 420601 - 420603, 420605, 420606 and the GPS sections, were intended to be those which will likely go out of service first, and can be rehabilitated without physically disturbing the other experimental sections In general, paving thickness increased as one progressed through the sections to facilitate paving operations

Routine maintenance consists of joint and crack sealing and patching limited to that normally performed by state maintenance personnel as a short duration activity

Westbound traffic was diverted to the outside lane of I-80 eastbound To provide access around the bridge deck treatment across SR 1002, a temporary route was constructed beneath the bridge on the north side of I-80 Several sections located at the beginning end of the SPS-6 project were occupied by concrete barriers during the active construction period Therefore, sampling and testing from these sections was delayed until completion of the test section paving work, at which time the barriers were removed

Data collection and material sampling on these sections were conducted in November, after the paving operations on the remaining sections had been completed

Preconstruction Monitoring

Data elements collected for this experiment consist of a manual distress survey, profile data using a Profilometer, non-destructive deflection testing using a Falling Weight Deflectometer and coring and soil samples Photographs, 1 and 2 show samples of the pre-treatment conditions

Test section numbers were re-marked on the pavement edge, as well as marking at 30 5m (100') intervals (from 0 to 5, or 0 to 10 for the 300m (1000') sections) The contractor established temporary bench marks identified by yellow pins for each test section located near station 5+00 (and 10+00), offset approximately 4 6m (15') into the slope outside of the shoulder A stake was also positioned beside each TBM identifying the elevation at the top of that pin The intent was to have the TBM's located at station 0+00 at all the test sections, but confusion with the SHRP stationing system resulted in the TBM's being positioned near the 5+00 station Stations increase with direction of traffic for SHRP, whereas PENNDOT stations increase west to east To avoid further confusion, pins painted white were placed approximately 4 6m (15') into the slope outside the shoulder, at each 0+00 station These pins were used when laying out the stations after all paving operations were finished The yellow pins (TBM's) were used as reference for the rod and level surveys

Five point cross section elevations were taken by NARO personnel at 15m (50') intervals at all the test sections

The bulk sample requirements for the SHRP Asphalt Research Program (Materials Reference Library) were determined by the NARO/SHRP office in Buffalo and the SHRP Asphalt Research Program office at the University of Texas at Austin The sample containers supplied by the Asphalt Research Program were labeled and shipped to William Smith at the H R I plant in Curtin Gap (Bellefonte), Pennsylvania

Project Details

Layout

Beginning at the east end of the project, and situated in the westbound lane, the test sections are laid out so that all the sections receiving overlays are grouped together as shown in the lower portion of Figure 2 The first four overlay sections consist of a 63mm (2 5") binder course covered by a 38mm (1 5") surface course The crack/break and seat section (420608) west of the bridge consists of a 36mm (1 4") leveling course plus an 89mm (3 5") binder course, followed by a 63mm (2 5") binder course covered by a 38mm (1 5") surface course

The overlay on the two rubblized sections consists of two lifts of a base material (total base course 127mm (5") on section 420660 and 229mm (9") on section 420661), covered by a 76mm (3") binder course and 38mm (1 5") surface course

As required by the SPS-6 experiment guidelines, all paving materials consisted of virgin mixes The beginning and ending stations of each surface preparation treatment, mix changes and overlay thickness change tapers are shown in the lower part of Figure 2 The beginning and ending stations for each test section shown in the upper part of Figure 2, are tabulated in Table 1 Actual overlay thicknesses as determined from levels, are shown in Table 17

On-site Layout Adjustments

The overlay on the state test section 420662 (previously designated 420609) was revised from 165 to 203mm Accordingly, the transition length between the 330mm section and the 203mm section was adjusted A taper of approximately 76m was left for transition between the two overlay sections One additional slab (19m, 61 5') was left for sampling, prior to relocated test section 420662 The new area (420662) was defined as eight full slab lengths (150m) with one final slab length designated for post-section sampling The total transition between 420661 and 420662 is 123 4m (405') The new section 420662, extended 1 9m (6 2') into the old 420609 section Distress surveys, profilometer, and FWD testing took place on August 4, 1992 through late August 1992

Materials Sampling and Testing

Preconstruction field sampling and testing was performed during the period from August 8-11, 1992. However, because of the traffic control pattern during construction, portions of the non-overlay test sections were covered by concrete median barrier Therefore, samples were taken in November 1992, subsequent to completion of the paving work

The initially designated 305mm (12") coring and augering to obtain granular base and subgrade samples was eliminated, instead, samples were taken from test pits TP1-TP4, and on 420605 (1000' section) on August 4-September 2, 1992 These test pits were located where full depth concrete patches were made

Preconstruction drilling and sampling of the test sections was performed by CMT Laboratories of State College, Pennsylvania Drilling began on August 10, 1992 and was completed on August 11, 1992 On August 8, 1992, bulk, split spoon, and moisture samples from subbase and subgrade were taken from test pit areas prior to drilling

Shoulder probes and split spoon samples were taken on August 8-10, as well as 102mm (4") concrete core samples Because several cores taken included steel reinforcement, and were difficult to extract, ten additional cores were taken to assure that cores in good condition were available for testing

Locations for field materials sampling and testing for each of the test sections are summarized on the line diagrams in the center of Figure 2 The upper line diagram shows preconstruction sampling locations of 102mm (4") O D , 152mm (6") O D cores, test pits, and shoulder probes, designated C, A, TP, and S respectively Photographs 3 and 4 show test pit data collection operations

The lower line diagram in Figure 2 shows postconstruction C type locations for obtaining 102mm (4") O D "as constructed" overlay test specimens The layout locations in Figure 2 are tabulated in Table 2. Table 3 summarizes the samples obtained prior to and during construction

The laboratory materials testing plans are tabulated in Table 4 for preconstruction samples, and in Table 5 for postconstruction samples The laboratory tracking tables are contained in Tables 6 through 9 These plans indicate which samples are to be tested by which SHRP test and protocol Those core samples which were not sufficiently sound to provide representative samples were replicated by removing a second core from the same sampling location These samples were identified by sequentially assigning numbers, beginning with the next available number after the last assigned sample number in the original sampling plan Table 7 indicates core condition as either poor (P), or good (G) Those samples indicated as poor were those with a second sample indicated for the same location

Samples taken for the SHRP Asphalt Materials Library in Texas are listed in Table 10 (The LTPP Materials Referance Library is currently located in Reno, Nevada)

Construction

Dates of construction activities are shown in Table 16 Surface preparation activities are summarized below

Section	Total # Slabs	Full Depth Repairs	Partial Depth Repairs	Sub-drainage
420603	9	3	7	2
420604	12	4	2	2
420605	28	8	8	4
420606	15	3	10	2
420607	10	-	-	2
420608	9	-	-	2
420660	9	-	-	1
420661	11	-	-	2
420662	11	-	-	1
TOTALS	**114**	**18**	**27**	**18**

Surface Preparation

A Vermeer wheel cut 102mm (4" wide) in section 420606 was initiated prior to work The work crew was directed to discontinue this work until the appropriate time These cuts were 'refilled' with bituminous material The sections incorrectly cut are 420606 at sta 4+25, and 5+27, and section 420604 at sta 4+25 (Site markings and distress surveys were subsequently performed) Additional cuts were found in section 420662 at sta 0+30, 1+25, 1+90, and 2+48, plus seven other locations in the transition between 420661 and 420662 All areas were repaired in a similar manner to that described above

Sections requiring routine maintenance required only joint and crack sealing and limited patching Minimum restoration consists of routine maintenance including limited patching, crack repair and sealing, and stabilization of joints The intensive CPR level consists of grinding, subsealing, subdrainage, joint repair and sealing, full depth patching with restoration of load transfer, and shoulder rehabilitation Photos 8 and 9 show the full depth patching operation Photo 5 shows the subsealing operation after patching was completed Photos 6 and 7 depict the partial depth spall repair operation. Photos 14, 15, and 16 show the pavement rubblization operation Photo 17 shows the installation of pavement edge drain Photos 12 and 13 show the pavement breaker, and cracked pavement slabs Photos 10 and 11 are of the diamond grinding operation and the resulting pavement texture Photo 22 shows the operation of taking profilograph measurements on the "ground" pavement surface All surface restoration and preparation treatments were performed between late August and late September Break and seating operations were performed on September 22, however, seating on 420607 was postponed until the following day due to equipment problems

Preconstruction data collection began on August 4 with deflection testing, faultmeter measurements, and distress surveys performed by NARO personnel It was discovered that the contractor had mistakenly sawed some areas within sections 420606, 420604, 420609 and an area between sections 420661 and 420609 The contractor refilled and compacted these areas, each approximately 102mm (4") wide and any protruding bars were cut off to avoid damage to the FWD and profilometer As a result of the inappropriately sawed areas in section 420609, PENNDOT decided to relocate this section into the transition area between sections 420661 and 420609 The new section was designated as 420662 to avoid any confusion with the tests performed earlier on section 420609

Mix Designs

Mix designs for the SPS-6 test sections were prepared by Mr Bill Smith of H R I , in accordance with PENNDOT design specifications Heavy duty criteria for mix designs were applied, according to policy at the time of construction

The aggregates used in the SPS-6 mixes were from the H R I Curtin Gap quarry The aggregate blends used to make the mixes are shown in Table 12 Tables 13, 14, and 15 contain the job mix formula gradations and tolerances, and examples of extraction plant records for virgin base course mix (heavy duty BCBC), virgin binder course mix (heavy duty ID-2), and virgin surface course mix (heavy duty ID-2 wearing)

An AC-20 asphalt cement supplied by Sun Refining and Marketing, Pennsylvania, was used in all the virgin mixes

Mix Production

The H R I asphalt batch plant is located off the I-80 Bellefonte exit, about seven miles from the east end of the project Photo 18 shows the plant setup Trucks generally required from 15-20 minutes to travel from the plant to the job site Control of mixes and placement at the job site was accomplished at the plant by preparing and storing calculated quantities of mix on computer printed tickets specifying mix design number, temperature at the plant and the time the load left this plant The material was then hauled in 18 2 Megagram (20 ton) truck batches to the job site

Lifts were generally placed on each test section in one day The scratch course was placed on September 23 and 24, the base course lifts on September 24 and 25, the binder course lift on September 25, 29, and 30, and the surface course on September 29 and October 1, 1992 See Table 16 for details of placement dates Table 17 indicates the layer thicknesses of both the original pavement and the rehabilitation treatment, as measured in each test section area

Paving

Paving was generally carried out with a 8 5m (28') wide paver covering both lanes and inside shoulder Outside shoulder paving with a 3 0m (10') wide pass was generally done last

Details of time and dates of paving, including mix temperatures at the plant and in the mat, and air temperature, are contained in Table 16 Paving of base courses were completed on September 24 and 25, 1992, and of binder courses on September 28, 29, and 30, 1992 Surface courses were laid on September 29 and October 1, 1992 Table 17 provides actual overlay thicknesses determined from levels taken at 5 points across the lane and at 15 2m (50') intervals along the 152 4m (500') test section Layer thicknesses of the original pavement were taken from field sampling bore hole and test pit logs Photos 19 through 21 show the pavement placement operation A detailed account of these operations is included from field notes in Appendix A

In an effort to keep the SPS-6 experiment section paving uniform and concise, the paving of these sections was held until the end of the paving work Paving of the test sections was deferred until the other mainline paving had been completed This resulted in paving of the test sections taking place late in the year, with several being placed under cool temperature conditions, (reference Table 16) Early rutting evidenced itself in several of the sections during the following summer, an indication that inadequate compaction was achieved during construction PENNDOT's previous experiences has determined that such performance results from paving in cool temperatures, without making appropriate operational adjustments

In addition, most of the test sections were placed on a long vertical upgrade, one of the most critical locations for the development of rutting Also, as expected, the thicker overlay pavement sections proved to be less susceptible to rutting than the intermediate thickness overlays By design, the acceptance samples were taken from the passing lane, outside of the test sections, and outside the heavily trafficked climbing lane Therefore, direct compaction results from the test lane are not available

To date, this rutting has not become sufficiently severe as to trigger action by the agency Unfortunately, the paving of the test sections on this project were apparently not representative of the majority of the paving which occurred throughout the project

Summary and Concluding Remarks

The construction of the SPS-6 project on I-80 in Pennsylvania was constructed in accordance with the experiment design In addition to the eight standard sections, three supplemental state sections were constructed

Evidence of early rutting of some of the test sections became apparent in the summer of 1993 A review of the weather conditions, during construction, the location on an upgrade, and a high level of truck traffic indicate that the test sections are subjected to a combination of conditions which are conducive to pavement surface rutting This problem has been observed, particularly in overlays of the SPS-6 type, asphalt surfacing of existing concrete pavement

PENNDOT does not employ nuclear density gauges, therefore density was determined by Department Restricted Performance Samples (RPS) These core samples were used to determine paving densities The core samples were removed from the passing lane and shoulders

APPENDIX A

Daily Summary of SPS-6 Experiment Sections

September 22, 1992

Joint repairs were being made on the intensive preparation with no overlay section (420605) Also pavement breaking on the sections for break and seat with slab sawn at 1/3 points section (420662) Section 420662 is a state supplemental section Four inch cores were used to verify the effectiveness of the breaking The cores fell to pieces upon removal, with no adhesion to reinforcement evident

Next, breaking was performed on the break and seat section with an 8" overlay section (420608) This was followed by the break and seat section with a 4" overlay section (420607) The latter section was not seated until the following day because the load on the 50 ton roller tipped while climbing the grade (Seating was performed and completed by 10 30 a m , using two passes per lane with the 50 ton roller) FWD testing was done on section 420603 Seating was accomplished on section 420607 the next day with a 30 ton roller It rained in the afternoon on this day, (again, only two passes per lane were applied for seatings)

September 23, 1992

Paving began on September 23, 1992, with the break and seat with an overlay section (420662), and a 4" overlay section (420607) The weather was cloudy and cool (45°F)

Tack coat was applied to the rubblized sections (420660, 420661) at 10 00 a m Tack coat was applied to the break and seat section (420607) at 2 00 p m An average 1" nominal leveling was applied to the break and seat with 1/3 point saw cuts (420662) at 2 45 p m Actual thickness varied for cross-slope correction from 1/2" at the edge of the pavement to 2" at the edge of the passing lane A seven man paving crew, 3 drum rollers, and 1 pneumatic roller, completed the work The section was completed at 3 35 p m

Paving began on the break and seat section with 8" overlay (420608) at 4 00 p m Rubblize sections (420660, 420661) were left overnight to allow the tack coat to cure

The leveling course was laid over sections 420608-420660 beginning at 4 00 p m A second pass, approximately 60' beyond the start of the transition was placed to correct a dip at a paving joint, between stations 0+30 and 1+00 The leveling course was applied from the break and seat with 8" overlay section (420608) to the transition for the rubblized with a 9 1/2" overlay section (420660) The section was completed at 4 55 p m

The leveling course on the shoulder began at 5 00 p m , using a 8' paver This extended from 420608 to 420662 This work was completed at 7 15 p m , that evening

Although contrary to PA DOT Pavement Design Policy, for this project, the nominal 1" leveling course was considered to be a part of the total design thickness Thus, overlay sections are theoretically 1" shy of design depth Since this 1" layer is an average, and not a minimum, it cannot be assured, for purposes of pavement evaluation, that the full depth of pavement structure exists at any given spot within the pavement structure

September 24, 1992

Placement of the BCBC layer commenced at 9 15 a m with the transition zone after the break and seat with 1/3 point saw cuts section (420662)

The uncompacted thickness averaged from 3" to 3 3/4", compacted thickness for the lift was 2 3/4" Laydown temperatures were between 305° and 315°F At 9 45 a m , a hose broke on a roller At the time the machine was within the transition zone An area of material approximately 10' x 10' was replaced as a result The potential impact on achieving adequate paving compaction in this area was not noted

Paving was stopped on the 420662 section, creating a construction joint within the layer

FWD testing was performed on the intensive preparation section with no overlay section (420605)

The paver returned to place a leveling course on sections 420660 and 420661 prior to completing the BCBC layer on section 420662 It was decided that the bituminous material samples for the project should be stockpiled until sufficiently cool to be placed in the plastic barrels for shipping It was expected that this cooling down process would require 4-5 days It actually took around 2 days

The first lift of BCBC was completed on section 420661

Placement of the BCBC on section 420607 was delayed until the next day, when the second lift was scheduled for placement in section 420661 The SHRP protocol required placement of overlay, within 48 hours of the pavement breaking operation

September 25, 1992

Placement of a 2 1/2" binder layer began on the passing lane of section 420607 at 9 00 a m The SHRP lane placement began at 9 30 a m , and was completed at 9 50 a m It was necessary for the ambient temperature to warm up to the minimum required by PA DOT specifications It was noted that the pavement was still hot at 12 00 p m The paver was moved back to continue placement of BCBC on section 420662 Section 420661 and 420660 were completed as well

A re-check of the overlay thickness (by rod and level) at sta 5+00 of section 420662 was considered to be "odd" The pre-construction survey was questioned, but this was resolved by the following day

The BCBC on section 420608 was completed by 6 00 p m

September 26, 1992

The weather was 50°F with rain in the morning Only work on the bridge deck placement was performed this day

September 28, 1992

Shoulder paving of BCBC began at approximately 8 15 a m on the section with break and seat (420662) It was completed at 11 30 a m on the section with break and seat with 8" overlay (420608) It was noted that the distance from plant to paving site was 11 5 km Paving of the binder layer subsequently began on this section The rolling pattern was as follows

Breakdown	Bomag	BW 202 AD	Combined total of 5 passes
	Bomag	BW 161 AD	Combined total of 5 passes
	Dresser	V 052-66B	5 passes - shoulder only
Finish	Dresser	5 W-14A	2 passes

Placement of the binder was completed on 420608 at 12 30 p m Work then began on section 420660 The afternoon weather was sunny and 72°F

During the afternoon paving, problems developed at the mixing plant, and a truck accident occurred on I-80 Consequently, the haul time to begin placement of binder material on section 420604 was very long Asphalt temperatures and thickness measurements were taken every 100' The binder layer on section 420662 was completed at 2 00 p m

September 29, 1992

The weather was clear and windy with the temperature at 48°F

Placement of the binder layer on shoulders for section 420662 began at 9 30 a m Placement of the wearing course began at 11 30 a m for this section Work was completed on this section at 4 15 p m

September 30, 1992

The weather was cloudy with a cool breeze and a temperature of 48°F Tack coat was placed on section 420603, 420604, and 420606, pavement and shoulders by 7 45 a m Placement of the wearing course began on section 420662 at 8 30 a m on the shoulders, from section 420607 to the end of the section 420605 This work was completed by 12 30 p m

Placement of the binder layer began on section 420604, using a 12' paving width This work was completed at 2 30 p m Paving of the SHRP test lane was completed by 4 00 p m

Three loads of binder material were then placed on the shoulder of section 420607 This was finished at 4 30 p m

October 01, 1992

The weather was sunny and both the surface and air temperature was at 40°F Paving was delayed until the temperature rose to within PA DOT specifications The second layer of a base material was placed on the shoulder beginning at 8 45 a m on section 420607

Shoulder backup materials were being placed on section 420608 through 420662

Surface course paving was accomplished with a 28' paver on section 420607 This work began at 11 00 a m and was completed through section 420606 at 1 00 p m

Asphalt material samples were sent to the SHRP asphalt laboratory in Texas

October 02, 1992

The weather was sunny with temperatures ranging from 65° to 75°F Wearing course material was placed on the shoulders of section 420607 and 420606 This portion of the work began at 9 00 a m and was completed at 10 30 a m

Sawing and sealing of the designated section (420604) was scheduled for October 18, 1992

This concludes overlay paving of the SPS-6 test sections

APPENDIX B

Attachment to C-408/90-7
Section 526
October 15, 1990

COMMONWEALTH OF PENNSYLVANIA
Department of Transportation
Harrisburg

RUBBLIZING OF CONCRETE PAVEMENT

Supplementing the Specifications
Publication 408 dated 1990

THIS IS A NEW SECTION

526.1 DESCRIPTION - This work is rubblizing the seating of existing concrete pavements prior to the placement of a pavement overlay

Rubblizing is classified into two types as follows

a) Type 1 Rubblizing pavement into pieces having a maximum horizontal dimension of 12 inches

b) Type 2 Rubblizing pavement into pieces having a maximum horizontal dimension of 8 inches and with at least 50% of the pieces per square yard having a maximum horizontal dimension of 4 inches

526.2 MATERIAL -

a) Coarse Aggregate, Type A or Type B, No 1 Section 703 2

b) Subbase, No 2A Section 350 2

526.3 CONSTRUCTION - As indicated and as follows

a) Equipment Submit a pavement rubblizing plan and list of proposed equipment for Department approval prior to the start of construction If, during rubblizing operations, satisfactory results are not being obtained, cease all rubblizing operations and submit an alternate plan and/or list of equipment capable of obtaining the specified results to the Engineer Resume rubblizing operations upon acceptance of the alternate plan

Repeat this procedure as necessary to obtain the specified results

b) Existing Bituminous Surfaces Remove any existing bituminous paving materials that are overlaying the concrete pavement, in accordance with Section 490 3, before beginning rubblizing operations Do not remove any existing full-depth bituminous patches

- More -

c) Rubblizing Use mechanical or sonic vibratory equipment capable of providing concrete pieces of the specified dimensions throughout the full depth of the pavement, on a regular and continuous basis Provide equipment suitable to the Engineer Remove any equipment from the project which fails to provide an acceptable product and replace with acceptable equipment

For Type 2 rubblizing, ensure that pieces are free of bond with reinforcement to permit adequate seating

Excavate two, 3-foot by 12-foot, full-depth sections of rubblized pavement, within the first 1/2-mile of rubblizing operations, to ensure that the pavement is being rubblized to the specified dimensions Excavate additional areas, as directed by the Engineer, to assure that the specified dimensions are being maintained Repeat the initial two sections, full-depth pavement removal testing procedure whenever the equipment, rubblizing pattern, or breaking force is changed

Use coarse aggregate to backfill all excavated areas Place backfill in maximum 6-inch lifts and compact by rolling until non movement is achieved Do not allow any shoving or wave motion under the roller

Cut off and remove any reinforcement steel exposed at the surface of the rubblized pavement If the transverse joints of the original pavement contained steel plates, remove any steel plates that are exposed

Exercise care during rubblizing operations to prevent shattering pavement edges adjacent to bituminous base repairs

Exercise extreme care during rubblizing operations to protect and prevent damage to underground utilities, drainage facilities, bridge approach slabs, and bridge decks Repair any damage that occurs to these areas, at no cost to the Department

d) Seating Following the rubblizing operation, use a 50-ton, pneumatic tired roller, meeting the requirements of Section 108 05(c)3 e, to seat the rubblized pavement Establish a rolling pattern that ensures all areas of rubblized pavement surface are directly contacted by the roller in no more that four passes Do not use vibratory rollers

Final seating of the rubblized pavement is satisfactory when vertical deflection under the roller is less than 3/4-inch Undercut areas where this condition is not achieved Remove all unsuitable or unstable material Backfill to existing subgrade with suitable material, to the top of existing subbase with subbase material, and to the top of the rubblized pavement with coarse aggregate Compact backfill as previously specified and as directed

50-ton rollers may only cross bridges as approved by the Bridge Engineer Repair any damage that occurs to bridge approach slabs and bridge decks during the seating operation, at no cost to the Department

e) Final Surface After final seating, sweep and clean the surface of the rubblized and seated pavement to remove all loose material

Do not allow traffic on the roadway after the pavement has been rubblized and seated

Repair all rubblized and seated pavement areas disturbed by construction traffic, at no cost to the Department

Complete all operations prior to construction of the leveling course If a bituminous leveling course is indicated, apply a prime coat to the rubblized and seated surface, as specified in Section 461, prior to placing the leveling course

Complete placement of the overlay within 60 calendar days after rubblizing and seating Do not leave the rubblized and seated pavement exposed to freezing conditions

526.4 MEASUREMENT AND PAYMENT -

a) Rubblized and seat concrete pavement Square Yard

b) Class 1B Excavation Cubic Yard
Measured to existing subgrade level

c) Class 1A Excavation Cubic Yard

d) Coarse Aggregate Cubic Yard
For the size indicated

e) Removal of existing Bituminous Surface Course Section 490 4

- The End -

FIGURE 1.0 : PA SHA SPS-6 PROJECT
I-80 WESTBOUND, CENTRE COUNTY, SNOWSHOE

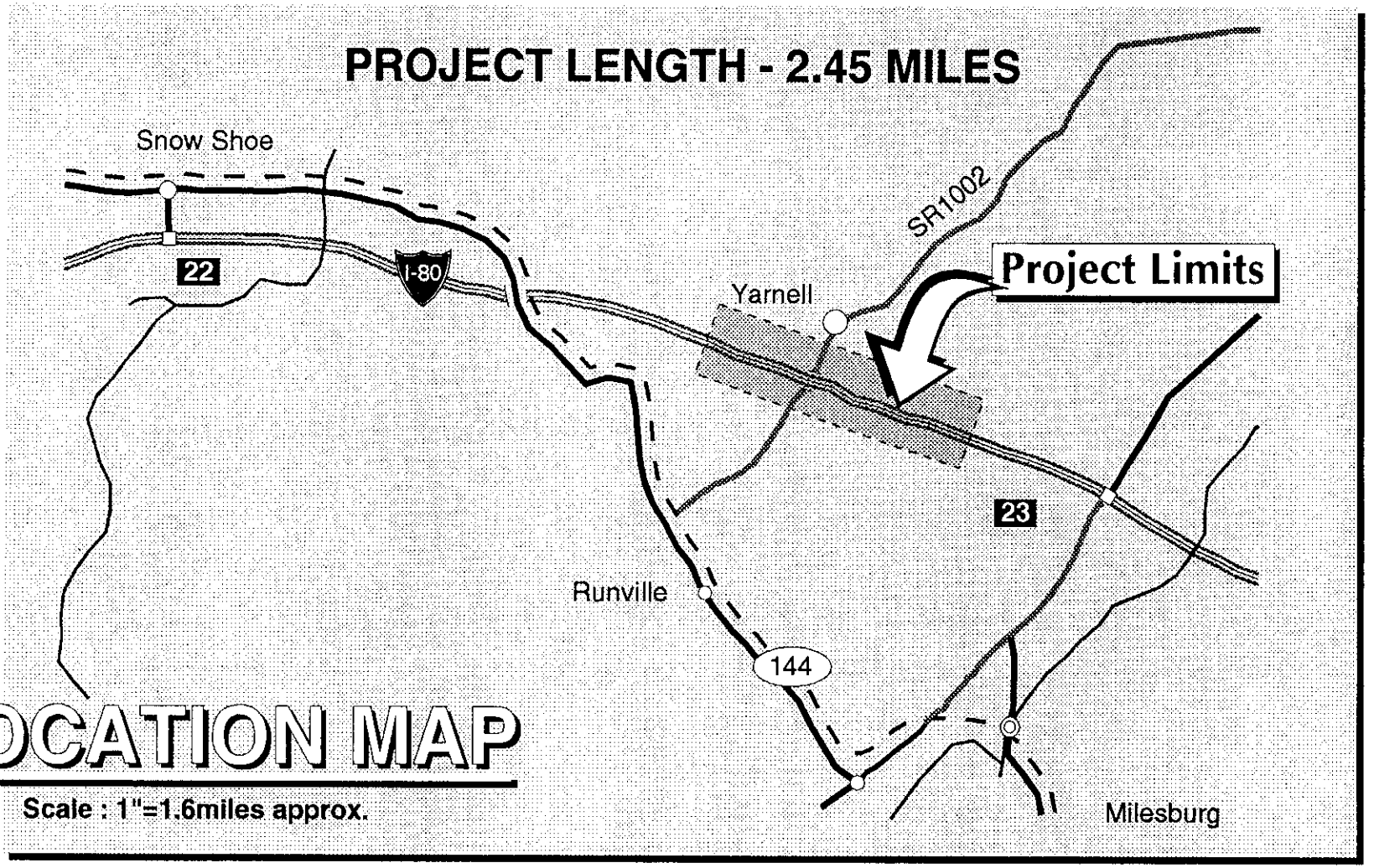


FIGURE 2

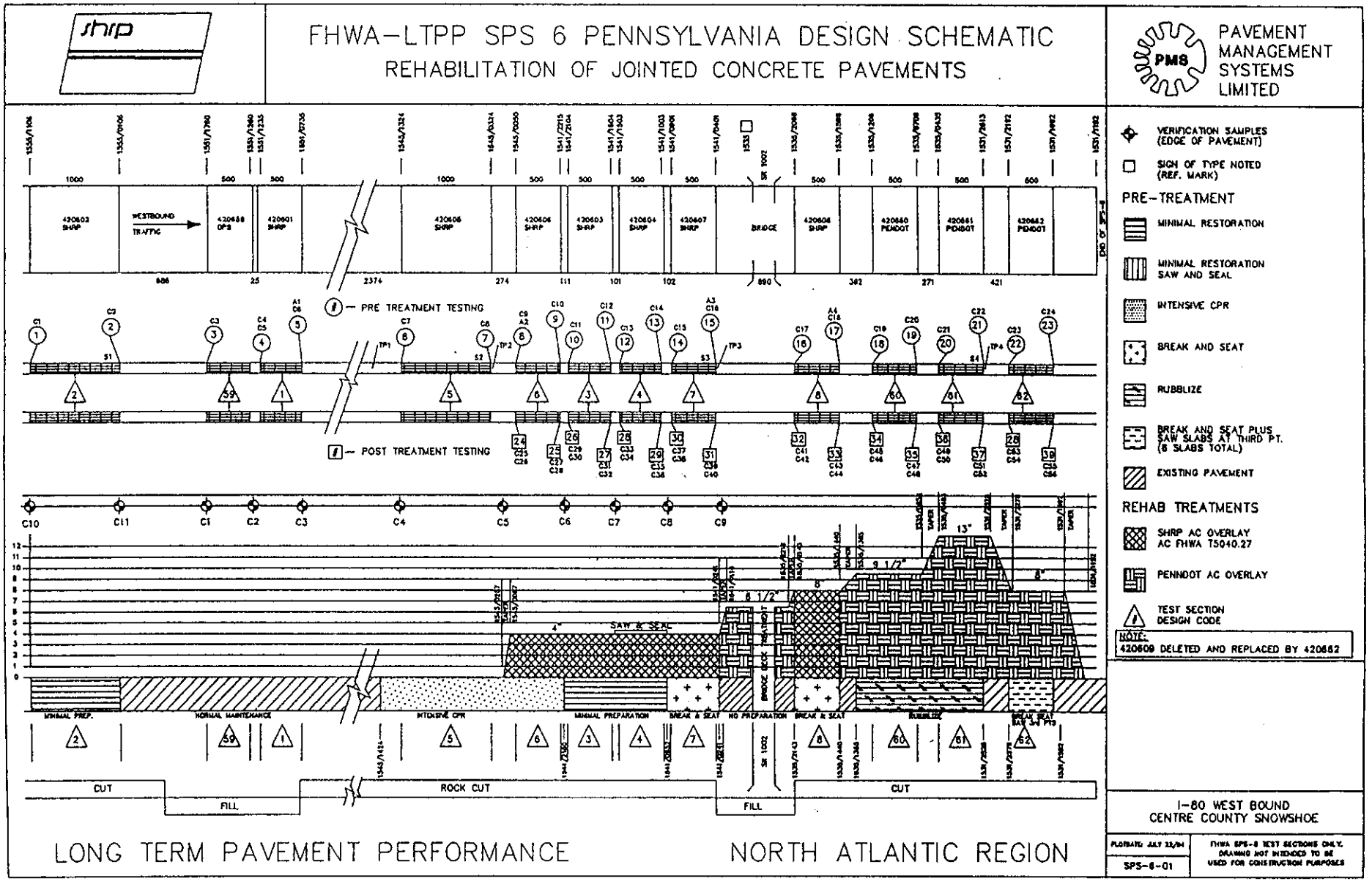
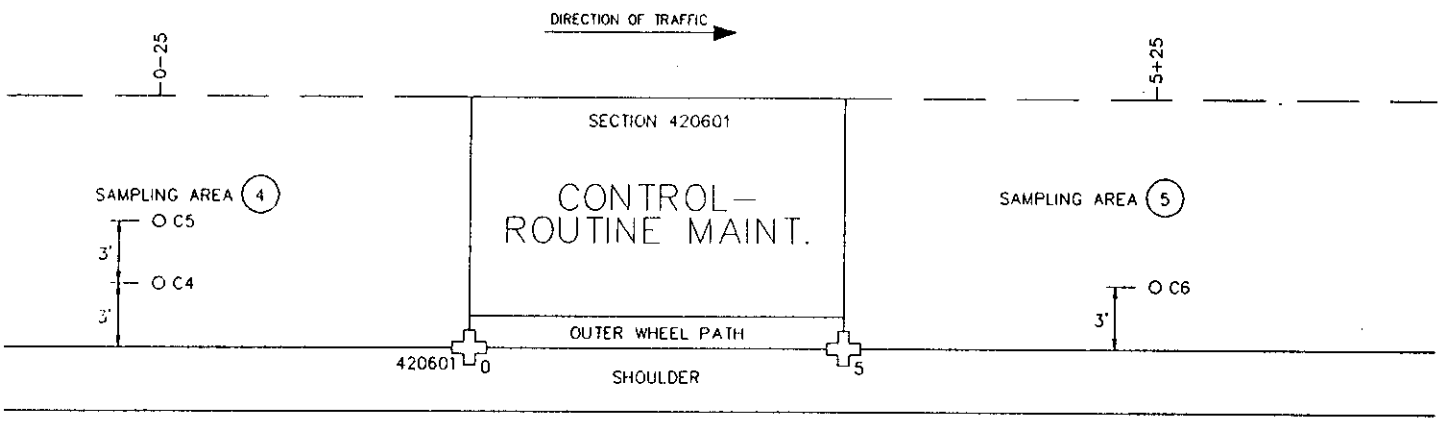

shrp
FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS
PMS
PAVEMENT MANAGEMENT SYSTEMS LIMITED
VERIFICATION SAMPLES (EDGE OF PAVEMENT)
SIGN OF TYPE NOTED (REF. MARK)
PRE-TREATMENT
MINIMAL RESTORATION
MINIMAL RESTORATION SAW AND SEAL
INTENSIVE CPR
BREAK AND SEAT
RUBBLIZE
BREAK AND SEAT PLUS SAW SLABS AT THIRD PT. (6 SLABS TOTAL)
EXISTING PAVEMENT
REHAB TREATMENTS
SHRP AC OVERLAY AC FHWA T5040.27
PENNDOT AC OVERLAY
TEST SECTION DESIGN CODE
NOTE:
420609 DELETED AND REPLACED BY 420662
PRE TREATMENT TESTING
POST TREATMENT TESTING
SAW & SEAL
CUT
FILL
ROCK CUT
FILL
CUT
I-80 WEST BOUND
CENTRE COUNTY SNOWSHOE
SPS-6-01
FHWA SPS-6 TEST SECTIONS ONLY. DRAWING NOT INTENDED TO BE USED FOR CONSTRUCTION PURPOSES
LONG TERM PAVEMENT PERFORMANCE
NORTH ATLANTIC REGION

FIGURE 3

shrp

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

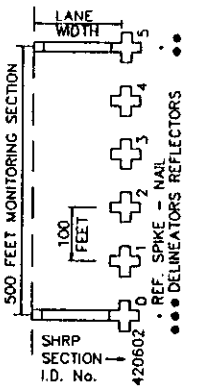
PMS PAVEMENT MANAGEMENT SYSTEMS LIMITED



PRE–CONSTRUCTION SAMPLING PLAN FOR SECTION 420601

O 4" OD core.

TYPICAL SITE SIGNING & MARKING



SPS 6
420601

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: JULY 29/92 | FHWA SPS-6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

SPS-6-04

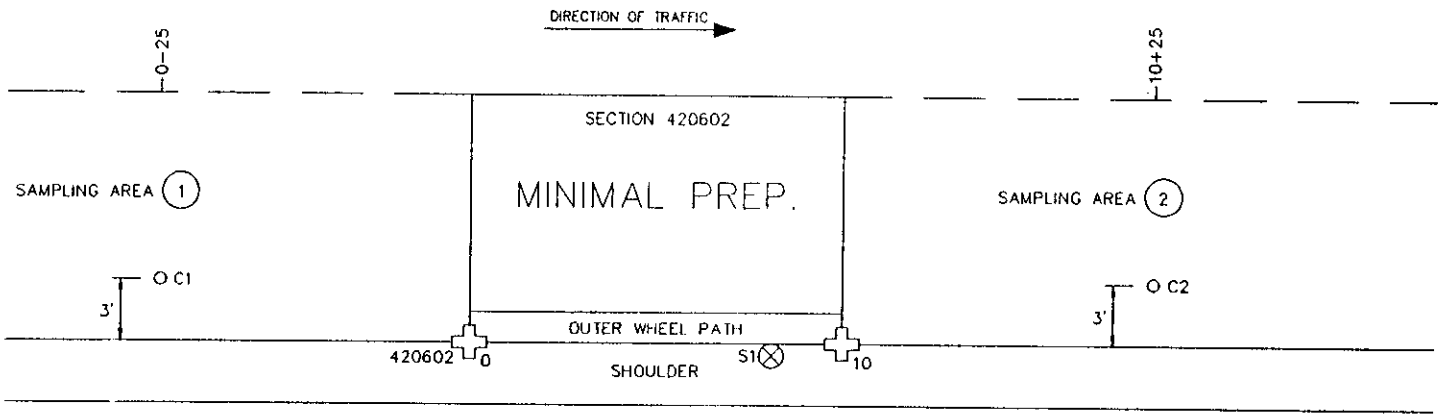
LONG TERM PAVEMENT PERFORMANCE NORTH ATLANTIC REGION

FIGURE 4

shrp

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

PMS PAVEMENT MANAGEMENT SYSTEMS LIMITED

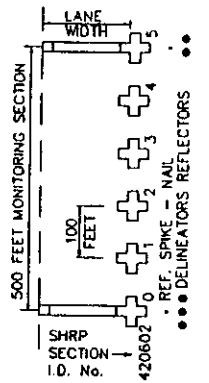


PRE–CONSTRUCTION SAMPLING PLAN FOR SECTION 420602

○ 4" OD core.

⊗ Auger probe in shoulder.

TYPICAL SITE SIGNING & MARKING



SPS 6 420602

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: JULY 29/92

SPS-6-02

FHWA SPS-6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

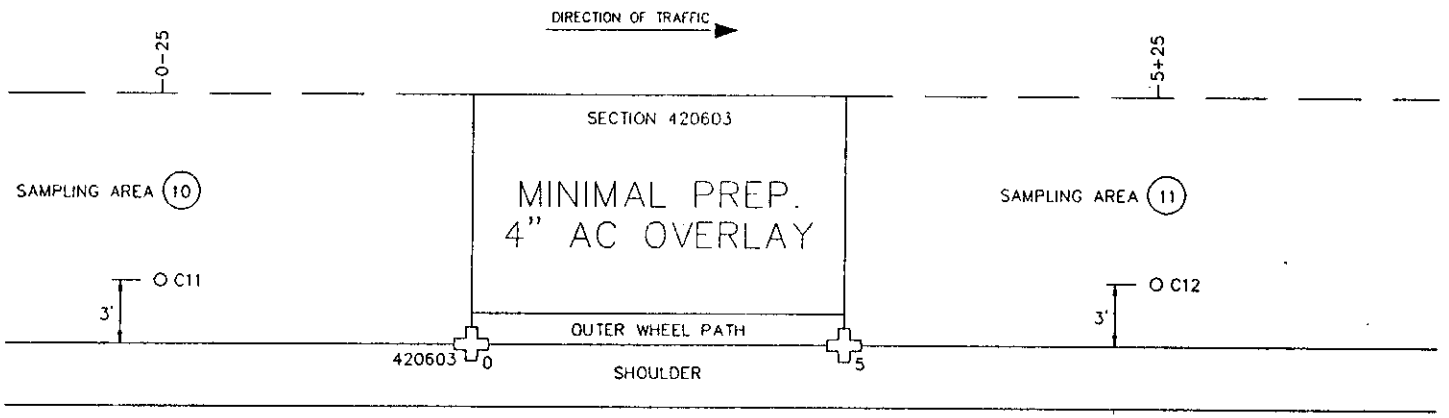
LONG TERM PAVEMENT PERFORMANCE

NORTH ATLANTIC REGION

FIGURE 5

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

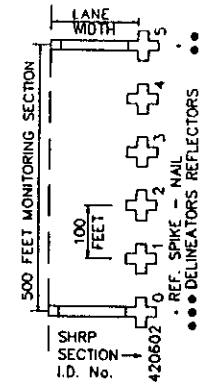
PAVEMENT MANAGEMENT SYSTEMS LIMITED



PRE–CONSTRUCTION SAMPLING PLAN FOR SECTION 420603

○ 4" OD core.

TYPICAL SITE SIGNING & MARKING



SPS 6
420603

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: JULY 29/92 | SPS-6-07

FHWA SPS-6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

LONG TERM PAVEMENT PERFORMANCE

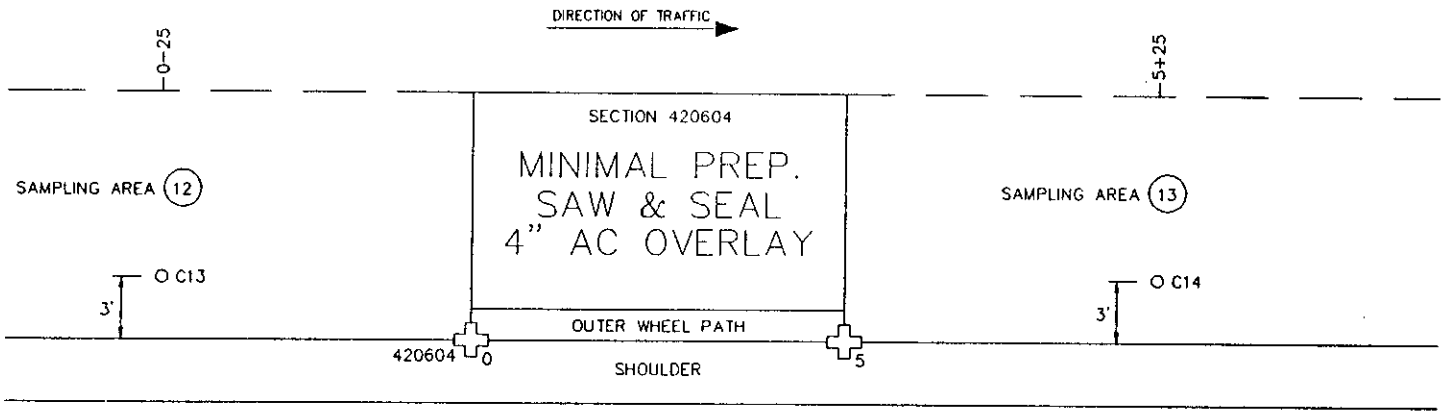
NORTH ATLANTIC REGION

FIGURE 6

shrp

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

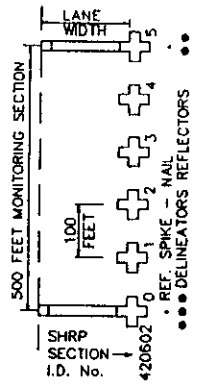
PMS PAVEMENT MANAGEMENT SYSTEMS LIMITED



PRE–CONSTRUCTION SAMPLING PLAN FOR SECTION 420604

○ 4" OD core.

TYPICAL SITE SIGNING & MARKING



SPS 6 420604

ROAD TEST

LONG TERM PAVEMENT PERFORMANCE

NORTH ATLANTIC REGION

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: JULY 20/93

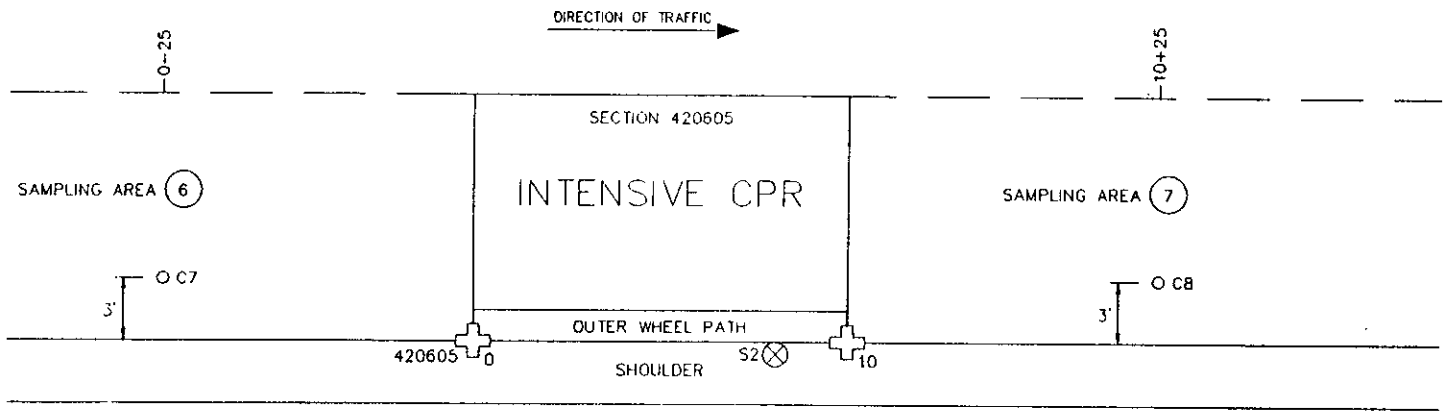
SPS-6-05

FHWA SPS-6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

FIGURE 7

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED

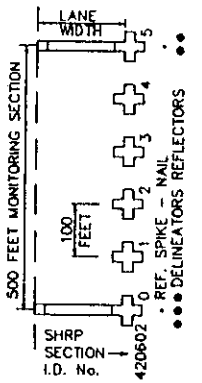


PRE–CONSTRUCTION SAMPLING PLAN FOR SECTION 420605

○ 4" OD core.

⊗ Auger probe in shoulder.

TYPICAL SITE SIGNING & MARKING



SPS 6
420605

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: JULY 29/92

SPS-6-05

FHWA SPS-6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

LONG TERM PAVEMENT PERFORMANCE

NORTH ATLANTIC REGION

FIGURE 8

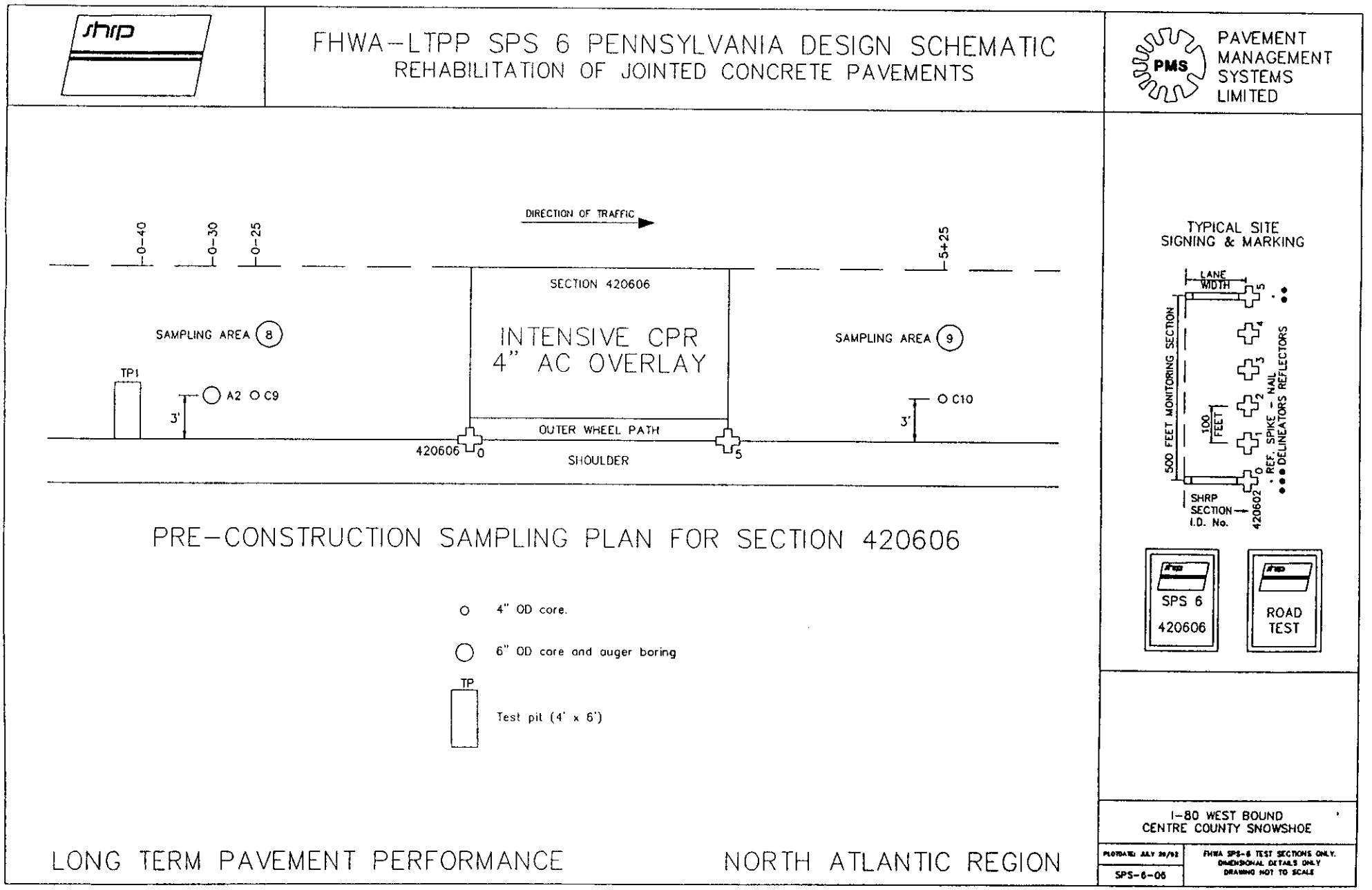
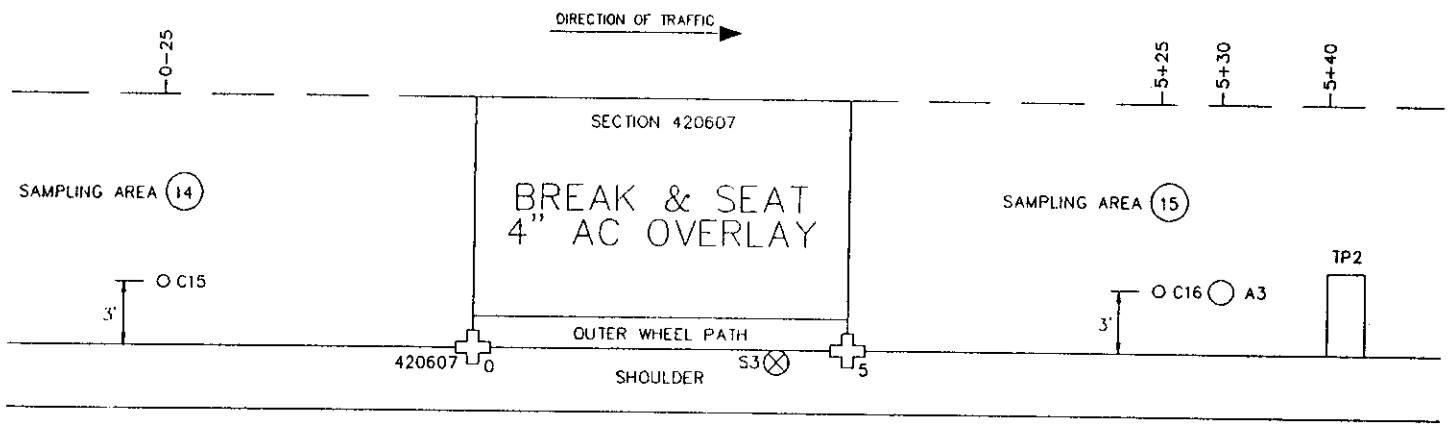

FHWA-LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS
PAVEMENT MANAGEMENT SYSTEMS LIMITED
DIRECTION OF TRAFFIC
0-40
0-30
0-25
5+25
SECTION 420606
INTENSIVE CPR
4" AC OVERLAY
SAMPLING AREA 8
SAMPLING AREA 9
TP1
A2
C9
C10
3'
3'
OUTER WHEEL PATH
420606 0
5
SHOULDER
PRE-CONSTRUCTION SAMPLING PLAN FOR SECTION 420606
4" OD core.
6" OD core and auger boring
TP
Test pit (4' x 6')
TYPICAL SITE SIGNING & MARKING
LANE WIDTH
500 FEET MONITORING SECTION
100 FEET
REF. SPIKE - NAIL
DELINEATORS REFLECTORS
SHRP SECTION I.D. No.
420602
SPS 6
420606
ROAD TEST
I-80 WEST BOUND
CENTRE COUNTY SNOWSHOE
SPS-6-06
FHWA SPS-6 TEST SECTIONS ONLY.
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE
LONG TERM PAVEMENT PERFORMANCE
NORTH ATLANTIC REGION

FIGURE 9

shrp

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

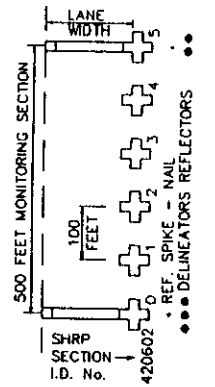
PMS PAVEMENT MANAGEMENT SYSTEMS LIMITED



PRE–CONSTRUCTION SAMPLING PLAN 420607

- ○ 4" OD core.
- ⊗ Auger probe in shoulder.
- ◯ 6" OD core and auger boring
- TP — Test pit (4' x 6')

TYPICAL SITE SIGNING & MARKING



SPS 6 420607

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: JULY 29/93 | FHWA SPS-6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

SPS-6-09

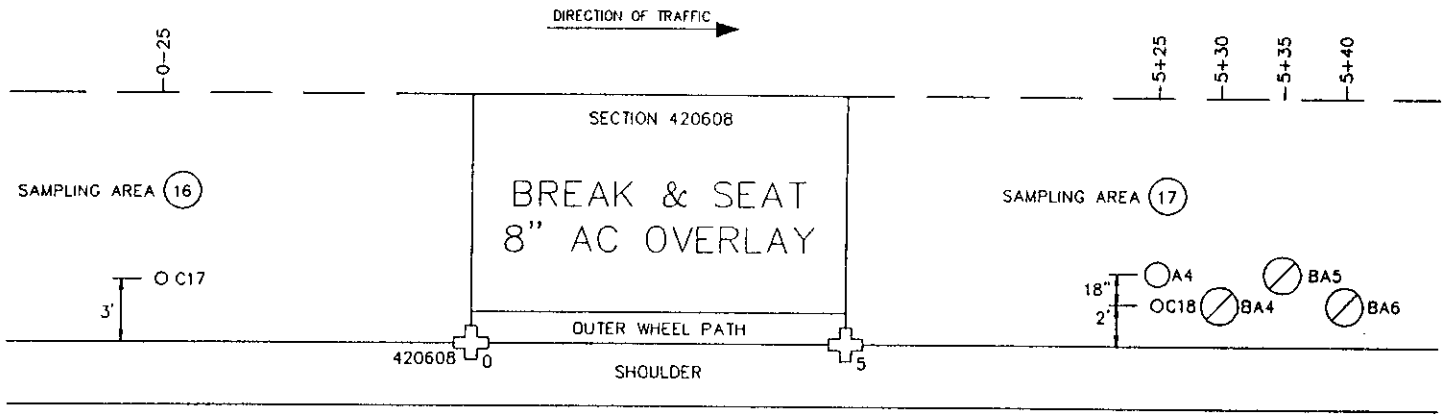
LONG TERM PAVEMENT PERFORMANCE — NORTH ATLANTIC REGION

FIGURE 10

shrp

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

PMS PAVEMENT MANAGEMENT SYSTEMS LIMITED



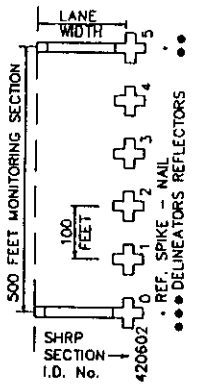
PRE–CONSTRUCTION SAMPLING PLAN FOR SECTION 420608

○ 4" OD core.

◯ 6" OD core and auger boring

⊘ 12" OD core and auger boring

TYPICAL SITE SIGNING & MARKING



SPS 6 420608

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

LONG TERM PAVEMENT PERFORMANCE

NORTH ATLANTIC REGION

PLOTDATE: JULY 20/92

SPS-6-10

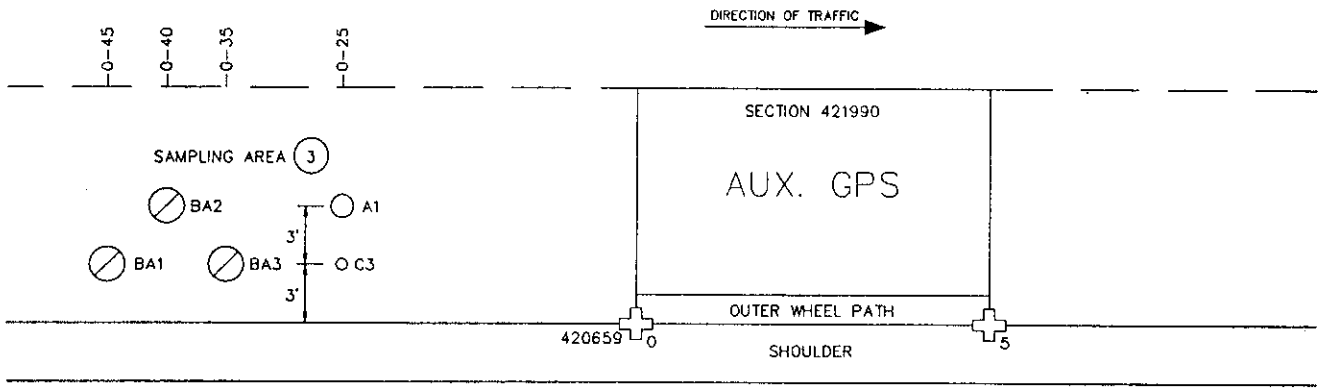
FHWA SPS-6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

FIGURE 11

shrp

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

PMS PAVEMENT MANAGEMENT SYSTEMS LIMITED



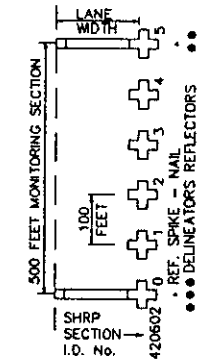
PRE–CONSTRUCTION SAMPLING PLAN FOR SECTION 420659

O 4" OD core.

6" OD core and auger boring.

12" OD core and auger boring.

TYPICAL SITE SIGNING & MARKING



SPS 6 420659

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: AUG 19/03

SPS-6-03

FHWA SPS-6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY. DRAWING NOT TO SCALE

LONG TERM PAVEMENT PERFORMANCE

NORTH ATLANTIC REGION

SPS-6-02

FIGURE 12

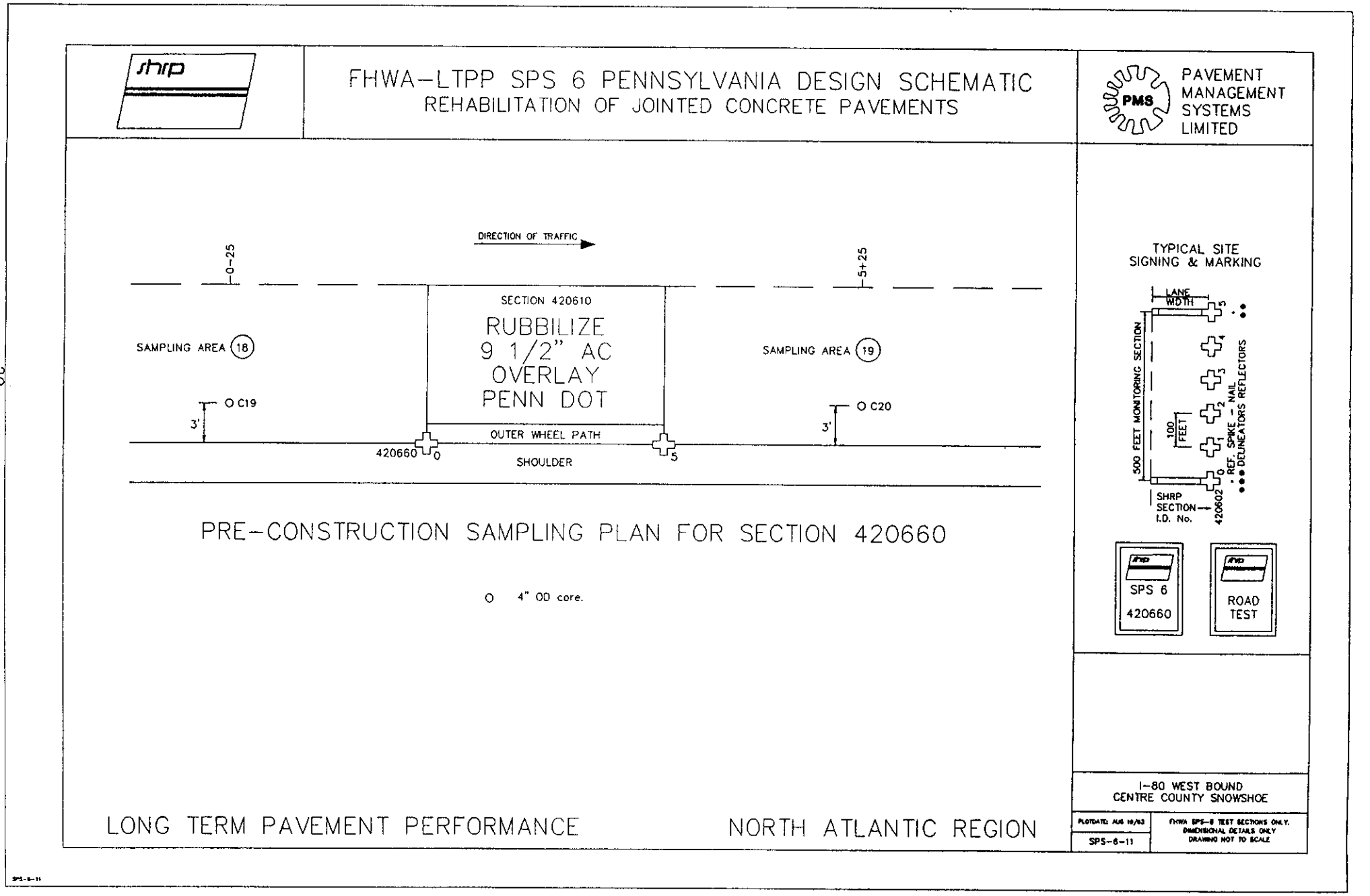
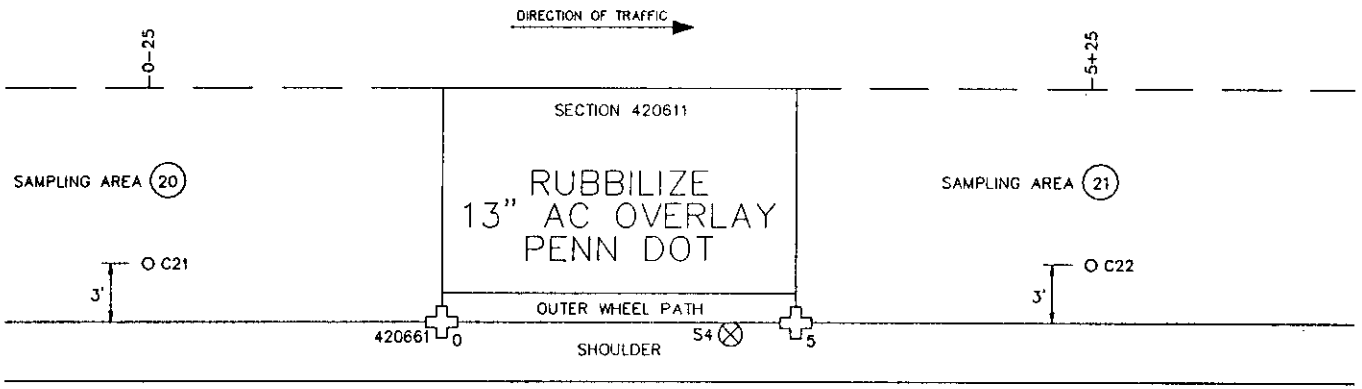

shrp
FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS
PMS
PAVEMENT MANAGEMENT SYSTEMS LIMITED
DIRECTION OF TRAFFIC
0-25
5+25
SECTION 420610
RUBBILIZE
9 1/2" AC
OVERLAY
PENN DOT
SAMPLING AREA (18)
SAMPLING AREA (19)
O C19
O C20
3'
3'
OUTER WHEEL PATH
420660 0
5
SHOULDER
PRE–CONSTRUCTION SAMPLING PLAN FOR SECTION 420660
O 4" OD core.
TYPICAL SITE SIGNING & MARKING
LANE WIDTH
500 FEET MONITORING SECTION
100 FEET
REF. SPIKE – NAIL
DEFLECTORS REFLECTORS
SHRP SECTION I.D. No.
420602
SPS 6
420660
ROAD TEST
I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE
PLOTDATE: AUG 10/93
SPS–6–11
FHWA SPS–6 TEST SECTIONS ONLY.
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE
LONG TERM PAVEMENT PERFORMANCE
NORTH ATLANTIC REGION

FIGURE 13

shrp

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

PMS PAVEMENT MANAGEMENT SYSTEMS LIMITED

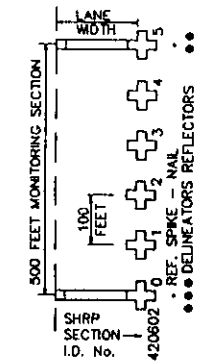


PRE–CONSTRUCTION SAMPLING PLAN FOR SECTION 420661

○ 4" OD core.

⊗ Auger probe in shoulder.

TYPICAL SITE SIGNING & MARKING



SPS 6 420661

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: AUG 10/93

SPS-6-12

FHWA SPS-6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

LONG TERM PAVEMENT PERFORMANCE

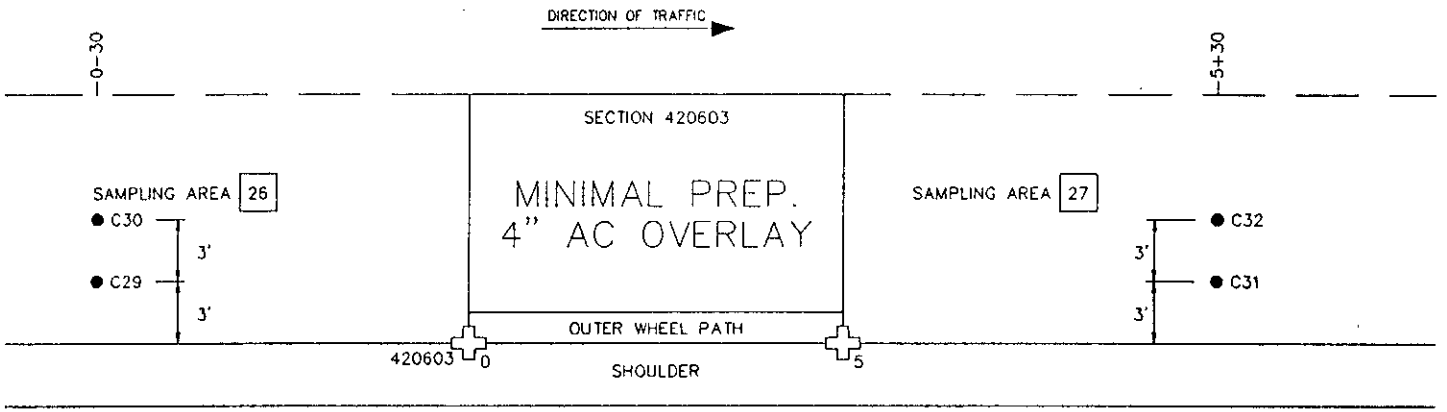
NORTH ATLANTIC REGION

SPS-6-12

FIGURE 14

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

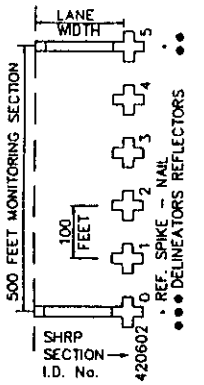
PAVEMENT MANAGEMENT SYSTEMS LIMITED



POST–CONSTRUCTION SAMPLING PLAN FOR SECTION 420603

● 4" OD core of AC overlay layers.

TYPICAL SITE SIGNING & MARKING



SPS 6 420603

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: JULY 29/92

SPS–6–15

FHWA SPS–6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

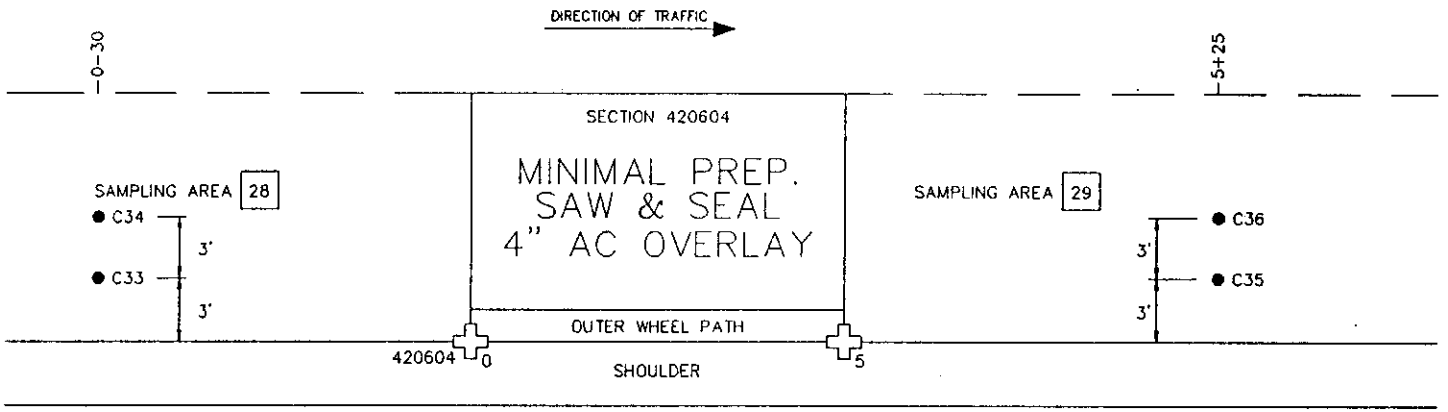
LONG TERM PAVEMENT PERFORMANCE

NORTH ATLANTIC REGION

FIGURE 15

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

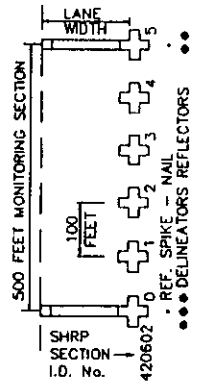
PAVEMENT MANAGEMENT SYSTEMS LIMITED



POST–CONSTRUCTION SAMPLING PLAN FOR SECTION 420604

● 4" OD core of AC overlay layers.

TYPICAL SITE SIGNING & MARKING



SPS 6
420604

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

LONG TERM PAVEMENT PERFORMANCE

NORTH ATLANTIC REGION

PLOTDATE: JULY 20/92

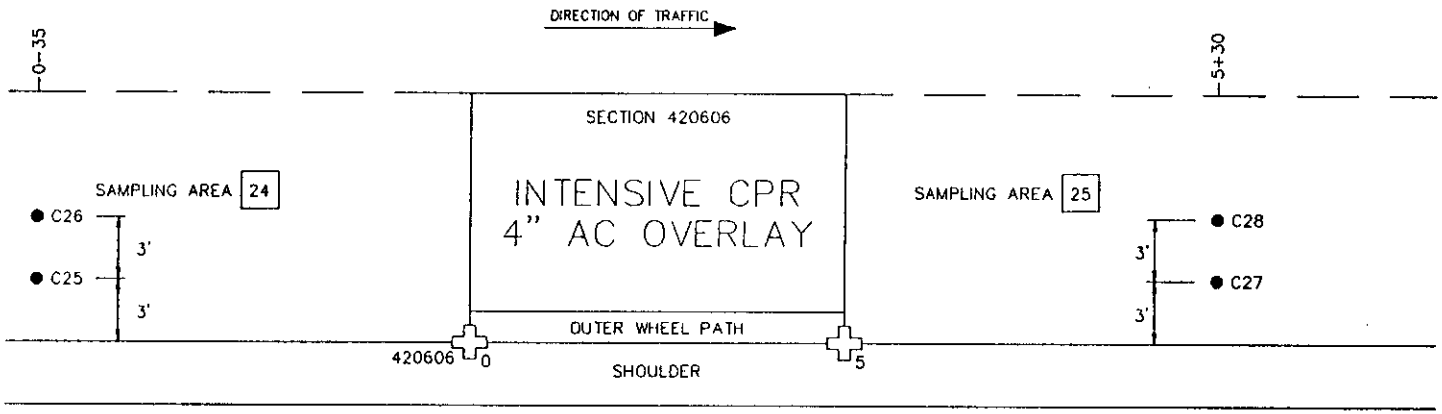
SPS-6-16

FHWA SPS-6 TEST SECTIONS ONLY.
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

FIGURE 16

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

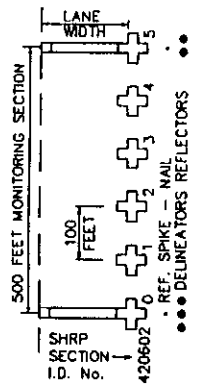
PAVEMENT MANAGEMENT SYSTEMS LIMITED



POST–CONSTRUCTION SAMPLING PLAN FOR SECTION 420606

● 4" OD core of AC overlay layers.

TYPICAL SITE SIGNING & MARKING



SPS 6
420606

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: JULY 29/92

SPS–6–14

FHWA SPS–6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

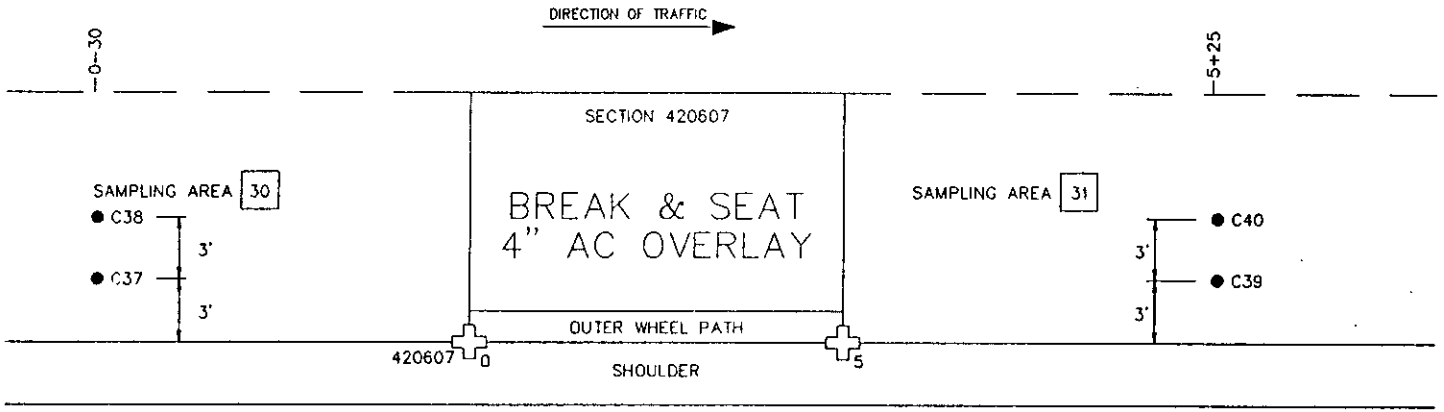
LONG TERM PAVEMENT PERFORMANCE

NORTH ATLANTIC REGION

FIGURE 17

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

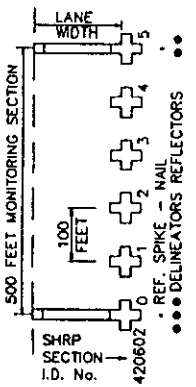
PAVEMENT MANAGEMENT SYSTEMS LIMITED



POST–CONSTRUCTION SAMPLING PLAN FOR SECTION 420607

● 4" OD core of AC overlay layers.

TYPICAL SITE SIGNING & MARKING



SPS 6
420607

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: JULY 29/92

SPS-6-17

FHWA SPS–6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

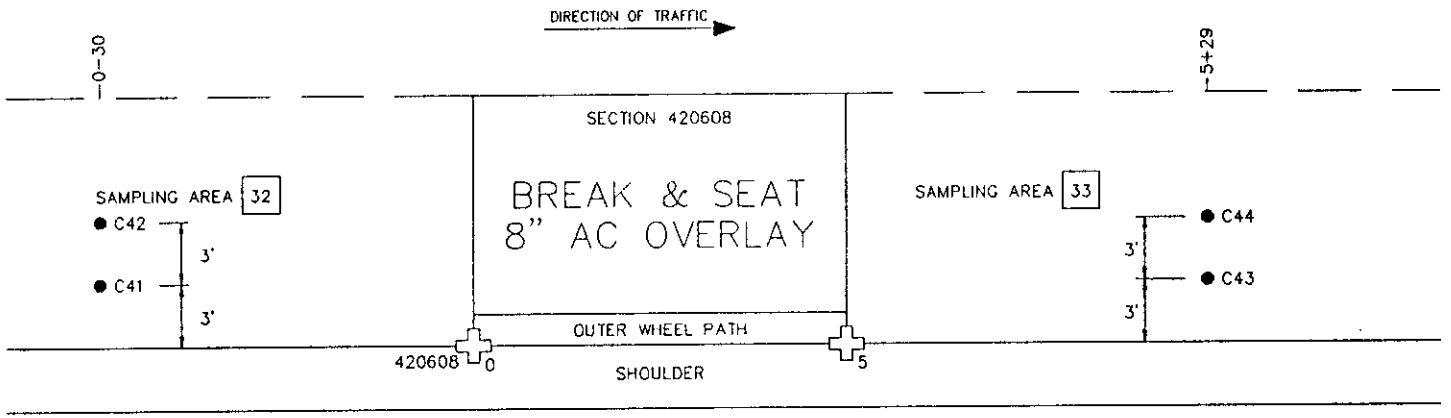
LONG TERM PAVEMENT PERFORMANCE

NORTH ATLANTIC REGION

FIGURE 18

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

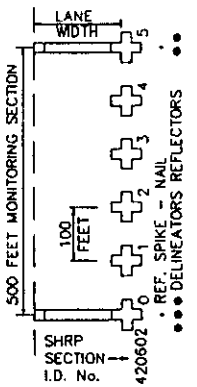
PAVEMENT MANAGEMENT SYSTEMS LIMITED



POST–CONSTRUCTION SAMPLING PLAN FOR SECTION 420608

● 4" OD core of AC overlay layers.

TYPICAL SITE SIGNING & MARKING



SPS 6
420608

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: JULY 29/93

FHWA SPS–6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

SPS–6–18

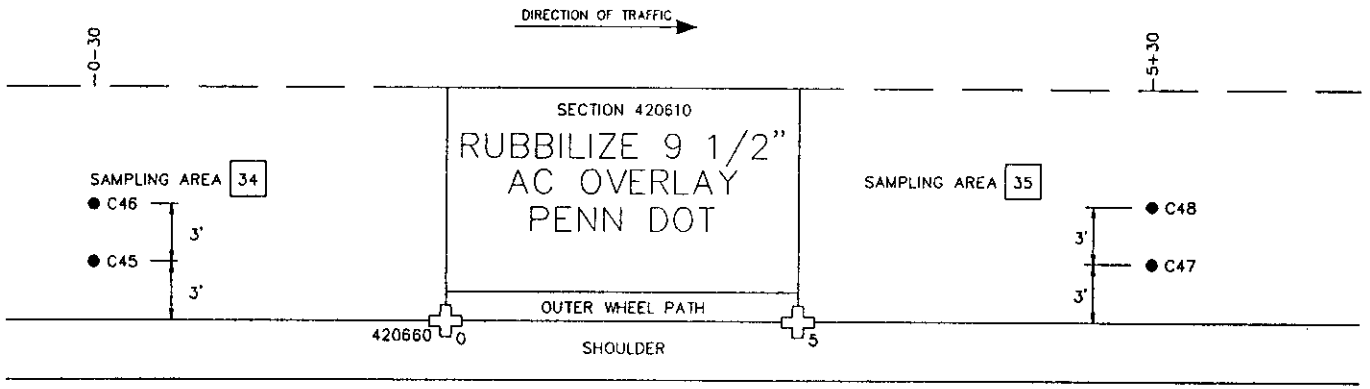
LONG TERM PAVEMENT PERFORMANCE

NORTH ATLANTIC REGION

FIGURE 19

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

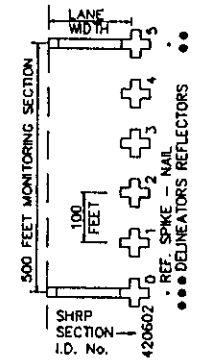
PAVEMENT MANAGEMENT SYSTEMS LIMITED



POST–CONSTRUCTION SAMPLING PLAN FOR SECTION 420660

● 4" OD core of AC overlay layers.

TYPICAL SITE SIGNING & MARKING



SPS 6
420660

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: AUG 19/93

SPS–6–19

FHWA SPS–6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

LONG TERM PAVEMENT PERFORMANCE

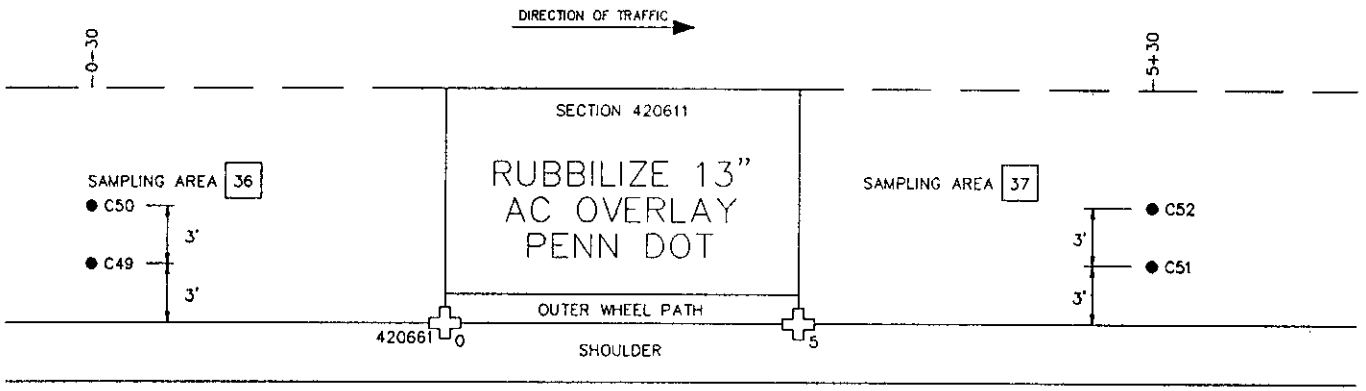
NORTH ATLANTIC REGION

FIGURE 20

shrp

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

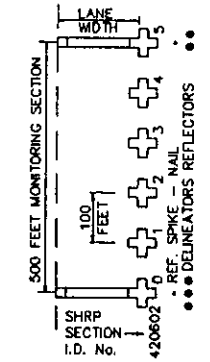
PMS PAVEMENT MANAGEMENT SYSTEMS LIMITED



POST–CONSTRUCTION SAMPLING PLAN FOR SECTION 420661

● 4" OD core of AC overlay layers.

TYPICAL SITE SIGNING & MARKING



SPS 6 420661

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATE: AUG 10/93

SPS–6–20

FHWA SPS–6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

LONG TERM PAVEMENT PERFORMANCE

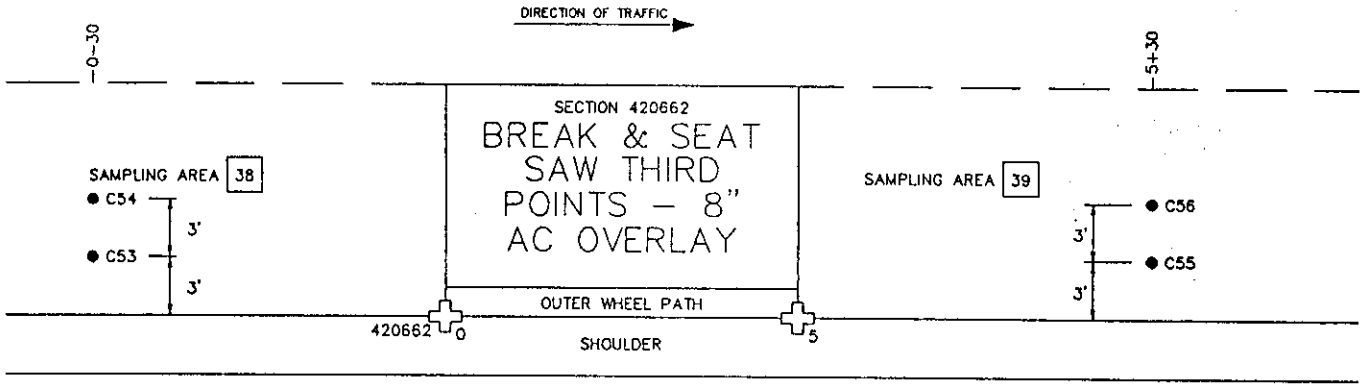
NORTH ATLANTIC REGION

FIGURE 21

shrp

FHWA–LTPP SPS 6 PENNSYLVANIA DESIGN SCHEMATIC
REHABILITATION OF JOINTED CONCRETE PAVEMENTS

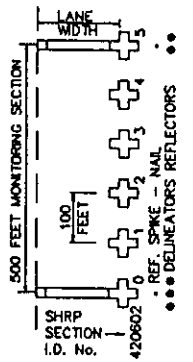
PMS PAVEMENT MANAGEMENT SYSTEMS LIMITED



POST–CONSTRUCTION PLAN FOR SECTION 420662

● 4" OD core of AC overlay layers.

TYPICAL SITE SIGNING & MARKING



SPS 6 420662

ROAD TEST

I–80 WEST BOUND
CENTRE COUNTY SNOWSHOE

PLOTDATED SEPT 1/94 | SPS–6–21

FHWA SPS–6 TEST SECTIONS ONLY. DIMENSIONAL DETAILS ONLY DRAWING NOT TO SCALE

LONG TERM PAVEMENT PERFORMANCE NORTH ATLANTIC REGION

TABLE 1
PA SPS-6 DOT TEST SECTION LAYOUT
I-80 WBL, Centre County

CONSTRUCTION STATION	SHRP ID	SURFACE PREPARATION	OTHER TREATMENTS	OVERLAY THICKNESS
1555/1106 to 1555/0106	420602	Minimum		0
1551/1760 to 1551/1260	420659	Normal		0
1551/1235 to 1551/0735	420601	Normal		0
1545/1324 to 1545/0324	420605	Intensive		0
1545/0050 to 1541/2215	420606	Intensive		4 inches
1541/2104 to 1541/1604	420603	Minimum		4 inches
1541/1503 to 1541/1003	420604	Minimum	Saw and Seal joints in AC	4 inches
1541/0901 to 1541/0401	420607	Break and Seat		4 inches
1535/2098 to 1535/1598	420608	Break and Seat		8 inches
1535/1206 to 1535/0706	420660	Rubblize		9-1/2 inches
1535/0435 to 1531/2613	420661	Rubblize		13 inches
1531/2192 to 1531/1692	420662	Break and Seat Saw slabs at 3rd pt		8 inches

TABLE 2
PA SPS-6 LAYOUT, I-80 WBL, CENTRE COUNTY, PA

STATION	SHRP I.D. NO	SECTION LENGTH	PAVEMENT PREPARATION	OVERLAY THICKNESS	OVERLAY MATERIAL	SAMPLING AREA	PRE-CONST. SAMPLES	POST-CONST. SAMPLES
							C1	
1555/1106 1555/0106	420602	1000	Minimum Preparation	No		1		
						2	C2, S5	
						3	C3	
1551/1760 1551/1260	420659	500	Normal Maint.	No				
						4	C4, C5, S4	
						4		
1551/1235 1551/0735	420601	500	Normal Maint.	No				
						5	C6, A1 S1, TP1	
						6	C7	
1545/1324 1545/0324	420605	1000	Intensive	No				
				Begin Taper 4"		7	C8, TP2	
						8/24	C9, A2	C25, C26
1545/0050 1541/2215	420606	500	Intensive	4"	1-1/2" HD ID-2 Binder 2-1/2" HD ID-2 Wearing			
						9/25	C10	C27, C28
						10/26	C11	C29, C30
1541/2104 1541/1604	420603	500	Minimal	4"	1-1/2" HD ID-2 Binder 2-1/2" HD ID-2 Wearing			
						11/27	C12	C31, C32
						12/28	C13	C33, C34
1541/1503 1541/1003	420604	500	Minimal	4"	1-1/2" HD ID-2 Binder 2-1/2" HD ID-2 Wearing			
						13/29	C14	C35, C36
wsz1 1541/0901 1541/0401	420607	500	Break and Seat	4"	2-1/2" HD ID-2 Binder 1-1/2" HD ID-2 Wearing	14/30	C15	C37, C38
			Bridge Deck Treatment	Begin Taper 4"-6-1/2" Ends Begin Taper 6-1/2"-8" Ends		15/31 16/32	C16, A3 TP3, S3 C17	C39, C40 C41, C42

TABLE 2 (cont.)
PA SPS-6 LAYOUT, I-80 WBL, CENTRE COUNTY, PA

STATION	SHRP I.D. NO	SECTION LENGTH	PAVEMENT PREPARATION	OVERLAY THICKNESS	OVERLAY MATERIAL	SAMPLING AREA	PRE-CONST. SAMPLES	POST-CONST. SAMPLES
1535/2098 1535/1598	420608	500	Break and Seat	8"	3-1/2" HD BCBC 2-1/2" HD ID-2 Binder 2" HD ID-2 Wearing			
				Begin Taper 8"- 9'1/2" Ends		17/33 18/34	C18, A4 C19	C43, C44 C45, C46
1535/1206 1535/0706	420660	500	Rubblize	9-12"	5" HD BCBC 2-1/2" HD ID-2 Binder 2" HD ID-2 Wearing			
				Begin Taper 9-1/2" -13" Ends		19/35 20/36	C20 C21	C47, C48 C49, C50
1535/0435 1531/2613	420661	500	Rubblize	13"	8-1/2" HD BCBC 2-1/2" HD ID-2 Binder 2" HD ID-2 Wearing			
				Begin Taper 13" - 8" Ends		21/37 22/38	C22, TP4, S4 C23	C51, C52 C53, C54
1531/2192 1531/1692	420662	500	Break and Seat Saw 3rd points	8"	3-1/2" HD BCBC 2-1/2" HD ID-2 Binder 2" HD ID-2 Wearing			
1531/1192					Project Ends	23/39	C24	C55, C56

TABLE 3
SUMMARY OF MATERIAL SAMPLES RETRIEVED
PA SPS-6, I-80 WBL, CENTRE COUNTY

Material and Sample Description	Number of Samples	Sample Location
ASPHALT CONCRETE		
During Construction		
(100 lbs uncompacted)		
Bulk Sampling	3	At Plant
PORTLAND CEMENT CONCRETE		
Pre-Construction		
4" O D Cores	34	C1-C24
6" O D Cores	4	A1-A4
UNBOUND SUBBASE		
Bulk Samples	4	TP1, TP2, TP3, TP4
SUBGRADE		
Bulk Samples	4	TP1, TP2, TP3, TP4
Splitspoon samples	7	A1(2), A2(2), A3(1), A4(2)
SHOULDER AUGER PROBES		
(Depth to Rigid Layer)	6	S1(9'), S2(9 5'), S3(8'), S4(8 3') S5(10'), S6(>20')
MATERIALS SHIPPED TO SHRP LIBRARY		
ASPHALT CEMENT		
AC-20	11	At Plant
AGGREGATE (1000 lbs total)	4	At Plant
ASPHALT CONCRETE MIX	9	At Plant

TABLE 4
PA SPS-6 DOT LABORATORY TESTING PLANS (Pre-Construction)

Material Type and Properties	SHRP Test Designation	SHRP Protocol	# of Tests per Layer	Materials Source/ Test Locations
I PORTLAND CEMENT CONCRETE				
Compressive Strength	PC01	P61	10	C1,C3,C5,C7,C9,C11,C13,C15,C17,C19
Splitting Tensile Strength	PC02	P62	10	C2,C4,C6,C8,C10,C12,C14,C16,C18,C20
PCC Coefficient of Thermal Expansion	PC03	P63	3	A1,A2,A3
Static Modulus of Elasticity	PC04	P64	6	C3,C5,C7,C11,C15,C17
PCC Unit Weight	PC05	P65	10	C1,C3,C5,C7,C9,C11,C13,C15,C17,C19
Core Examination/Thickness	PC06	P66	23	C1-C20, A1,A2,A3
II. BOUND (TREATED) BASE AND SUBBASE				
Type and Classification of Material and Treatment	TB01	P31	3	C5,C11,C19
Pozzolanic/Cementitious Compressive Strength	TB02	P32	3	C5,C11,C19
Asphalt treated Dynamic Modulus (77F)	TB03	P33	3	C5,C11,C19
HMAC Resilient Modulus	AC07	P07	3	C5,C11,C19
III. UNBOUND GRANULAR BASE AND SUBBASE				
Particle Size Analysis	UG01	P41	3	TP1 (BA1-3) TP2
Sieve Analysis (washed)	UG02	P41	3	TP1 (BA1-3) TP2
Atterburg Limites	UG04	P43	3	TP1 (BA1-3) TP2
Moisture-Density Relations	UG05	P44	3	TP1 (BA1-3) TP2
Resilient Modulus	UG07	P46	3	TP1 (BA1-3) TP2
Classification	UG08	P47	3	TP1 (BA1-3) TP2
Permeability	UG09	P48	3	TP1 (BA1-3) TP2
Natural Moisture Content	UG10	P49	3	TP1 (BA1-3) TP2

Note Samples within brackets are from the same sampling location

TABLE 4 (Cont.)
PA SPS-6 DOT LABORATORY TESTING PLANS (Pre-Construction)

Material Type and Properties	SHRP Test Designation	SHRP Protocol	# of Tests per Layer	Materials Source/ Test Locations
IV. SUBGRADE				
Sieve Analysis	SS01	P51	3	TP1 (BA1-3) TP2
Hydrometer to 0 001 mm	SS02	P42	3	TP1 (BA1-3) TP2
Atterburg Limits	SS03	P43	3	TP1 (BA1-3) TP2
Classification	SS04	P52	6	TP1 (BA1-3) TP2 A1,A2,A3
Moisture-Density Relations	SS05	P55	3	TP1 (BA1-3) TP2
Resilient Modulus	SS07	P46	3	A1,A2,A3
Unit Weight	SS08	P56	6	TP1 (BA1-3) TP2 A1,A2,A3
Natural Moisture Content	SS09	P49	3	TP1 (BA1-3) TP2
Depth to Rigid Layer			3	S1,S2,S3

TABLE 5
PA SPS-6 DOT LABORATORY TESTING PLANS (Post-Construction)

Material Type and Properties	SHRP Test Designation	SHRP Protocol	# of Tests per Layer	Materials Source/ Test Locations
I ASPHALT CONCRETE				
Core Examination/Thickness	AC01	P01	20	ALL CORES
Bulk Specific Gravity	AC02	P02	20	ALL CORES
Maximum Specific Gravity	AC03	P03	3	BV1,BV2, BV3
Asphalt Content (Extraction)	AC04	P04	3	BV1,BV2, BV3
Moisture Susceptibility	AC05	P05	3	BV1,BV2, BV3
Creep Compliance	AC06	P06	3	C25,C34,C36
Resilient Modulus	AC07	P07	3	(C21,C22,C23), (C32,C32,C33), (C38,C39,C40)
Tensile Strength	AC07	P07	3	C24,C30,C37
II. EXTRACTED AGGREGATE				
Bulk Specific Gravity				
Coarse Aggregate	AG01	P11	3	FROM UNCOMPACTED MIX
Fine Aggregate	AG02	P12	3	FROM UNCOMPACTED MIX
Type and Classification				
Coarse Aggregate	AG03	P13	3	FROM UNCOMPACTED MIX
Fine Aggregate	AG03		3	FROM UNCOMPACTED MIX
Gradation of Aggregate	AG04	P14	3	FROM UNCOMPACTED MIX
Roundness Index of Coarse Aggregate	AG06	P14B	3	FROM UNCOMPACTED MIX
NAA Test for Fine Aggregate Particle Shape	AG05	P14A	3	FROM UNCOMPACTED MIX
III ASPHALT CEMENT (FROM MIX)*				
Absorption Recovery	AE01	P21	3	FROM UNCOMPACTED MIX
Penetration at 50F, 77F, 90F	AE02	P22	3	FROM UNCOMPACTED MIX
Specific Gravity (60F)	AE03	P23	3	FROM UNCOMPACTED MIX
Viscosity at 77F	AE04	P24	3	FROM UNCOMPACTED MIX
Viscosity at 140F, 275F	AE05	P25	3	FROM UNCOMPACTED MIX

Note Samples within brackets are from same sampling location

TABLE 6
PA SPS-6 PRE-CONSTRUCTION SAMPLING - TRACKING TABLE, SUBGRADE, SUBBASE
PA DOT LABORATORY

LTPP SECTION I.D.	MONITOR STA.	OFFSET ft'.	LOCATION NO.	SAMPLE SIZE & TYPE	SAMPLE NO.	LAB. TEST	LABORATORY TEST SEQUENCE					
							FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH
420601	5+14.50	6.0'	A1	2 Jars-S Spoon-SS	JS01	2						
8/11/92			A1	2 Jars-S Spoon-SS	JS02	2						
	5+14.56		TP1	4 Bags SB	BG01	2	UG09/P48					
			TP1	1 Moist. Jar. SB	MG01	2	UG10/P49					
			TP1	4 Bags SS	BS01	2	SS11/P57					
			TP1	1 Moist. Jar. SS	MS01	2	SS09/P49					
420606	0-30	3.0'	A2	2 Jars S Spoon-SS	JS03	1						
8/10/92				2 Jars S Spoon-SS	JS04	1						
420607	5+30	3.0'	A3	2 Jars S Spoon-SS	JS05	2						
8/10/92												
420608	5+29	3.5'	A4	2 Jars S Spoon-SS	JS06	2						
8/10/92			A4	2 Jars S Spoon-SS	JS07	2						

TABLE 6A
PA SPS-6 PRE-CONSTRUCTION SAMPLING - TRACKING TABLE, SUBGRADE, SUBBASE
FHWA CONTRACTOR LABORATORY (LAW ENG., ATLANTA)

LTPP SECTION I D	MONITOR STA	OFFSET ft'	LOCATION NO	SAMPLE SIZE & TYPE	SAMPLE NO	LAB TEST	LABORATORY TEST SEQUENCE					
							FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH
420605	10+72		TP2	4 Bags SS	BS02	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46
8/11/92			TP2	1 Moist Jar SS	MS02	2	SS09/P49					
			TP2	4 Bags SB	BG02	2	UG01/P41	UG02/P41	UG04/P43	UG05/P44	UG08/P47	UG07/P46
			TP2	1 Moist Jar SB	MG02	2	UG10/P49					
420607	5+30		TP3	4 Bags SS	BS03	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46
8/10/92			TP3	1 Moist Jar SS	MS03	2	SS09/P49					
			TP3	4 Bags SB	BG03	2	UG01/P41	UG02//P41	UG04/P43	UG05/P44	UG08/P47	UG07/P46
			TP3	1 Moist Jar SB	MG03	2	UG10/P49					
420661	5+229		TP4	4 Bags SS	BS04	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46
8/6/92			TP4	1 Moist Jar SS	MS04	2	SS09/P49					
			TP4	4 Bags SB	BG04	2	UG01/P41	UG02/P41	UG04/P43	UG05/P44	UG08/P47	UG07/P46
				1 Moist Jar SB	MG04	2	UG10/P49					

TABLE 7
PA SPS-6 PRE-CONSTRUCTION SAMPLING - TRACKING TABLE, PCC CORES
PA DOT LABORATORY

LTPP SECTION I D	MONITOR STA	OFFSET ft'	LOCATION NO	SAMPLE SIZE & TYPE	SAMPLE NO	LAB TEST	LABORATORY TEST SEQUENCE					
							FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH
420602	0-25	3 0'	C1	4" OD PCC CORE-G	CP01	1	PC06/P66	PC05/P65	PC01/P61			
11/17/92	10+25	3 0'	C2	4" OD PCC CORE-G	CP02	2	PC06/P66	PC02/P62				
420659	0-25	3 3'	C3	4" OD PCC CORE-G	CP03	1	PC06/P66	PC05/P65	PC04/P64	PC01/P61		
420601	5+14 50	3 0'	C6	4" OD PCC CORE-G	CP06	2	PC06/P66	PC02/P62				
8/11/92		6 0'	A1	6" OD PCC CORE-	CP51	2	PC06/P66	PC03/P63*				
420605	0-25	3 0'	C7	4" OD PCC CORE-G	CP07	1	PC06/P66	PC05/P65	PC04/P64	PC01/P61		
8/11/92	10+25	3 0'	C8	4" OD PCC CORE-P	CP08	2						
	10+24 5	3 5'	C8	4" OD PCC CORE-G	CP25	2	PC06/P66	PC02/P62				
420606	0-25	3 0'	C9	4" OD PCC CORE-G	CP09	1	PC06/P66	PC05/P65	PC01/P61			
8/10/92	0-30	3 0'	A2	6" OD PCC CORE-	CP52	1	PC06/P66	PC03/P63*				
	5+35	3 0'	C10	4" OD PCC CORE-G	CP10	2	PC06/P66	PC02/P62				
420603	0-25	3 0'	C11	4" OD PCC CORE-P	CP11	1						
8/10/92	0-25	3 5'	C11	4" OD PCC CORE-G	CP26	1	PC06/P66	PC05/P65	PC04/P64	PC01/P61		
	5+25	3 0'	C12	4" OD PCC CORE-G	CP12	2	PC06/P66	PC02/P62				
420604	0-25	3 0'	C13	4" OD PCC CORE-G	CP13	1	PC06/P66	PC05/P65	PC01/P61			
8/10/92	5+25	3 5'	C14	4" OD PCC CORE-P	CP14	2						
	5+24 5	3 5'	C14	4" OD PCC CORE-G	CP27	2	PC06/P66	PC02/P62				
420607	0-26	3 0'	C15	4" OD PCC CORE-P	CP15	1						
8/10/92	0-26 5	3 5'	C15	4" OD PCC CORE-G	CP28	1	PC06/P66	PC04/P64	PC01/P61			
	5+25	3 0'	C16	4" OD PCC CORE-G	CP16	2	PC06/P66	PC02/P62				
	5+30	3 0'	A3	6" OD PCC CORE-	CP53	2	PC06/P66	PC03/P63*				

* SHRP Cores A1, A2, A3 to FHWA c/o

Ms Marcia Simon TFHRC,
HNR-20, 6300 Georgetown Pike,
McLean, Virginia 22101-2296

TABLE 7 (Cont.)
PA SPS-6 PRE-CONSTRUCTION SAMPLING - TRACKING TABLE, PCC CORES
PA DOT LABORATORY

LTPP SECTION I D	MONITOR STA	OFFSET ft'	LOCATION NO	SAMPLE SIZE & TYPE	SAMPLE NO	LAB TEST	LABORATORY TEST SEQUENCE					
							FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH
420608	0-25	3 0'	C17	4" OD PCC CORE-P	CP17	1						
8/10/92	0-25 5	3 5'	C17	4" OD PCC CORE-G	CP29	1	PC06/P66	PC05/P65	PC04/P64	PC01/P61		
	5+29	2 0'	C18	4" OD PCC CORE-G	CP18	2	PC06/P66	PC02/P62				
	5+29	3 5'	A4	6" OD PCC CORE-	CP54	2						
420660	0-25	3 0'	C19	4" OD PCC CORE-P	CP19	1						
8/10/92	0-25 5	3 5'	C19	4" OD PCC CORE-P	CP30	1						
	0-24 5	3 5'	C19	4" OD PCC CORE-G	CP31	1	PC06/P66	PC05/P65	PC01/P61			
	5+25	3 0'	C20	4" OD PCC CORE-P	CP20	2						
	5+24 5	3 5'	C20	4" OD PCC CORE-G	CP32	2	PC06/P66	PC02/P62				
420661	0-25	3 0'	C21	4" OD PCC CORE-G	CP21	1	PC06/P66	PC05/P65	PC01/P61			
8/10/92	5+25	3 0'	C22	4" OD PCC CORE-G	CP22	2	PC06/P66	PC02/P62				
420662	0-25	3 0'	C23	4" OD PCC CORE-P	CP23	1						
8/10/92	0-25 5	3 5'	C23	4" OD PCC CORE-G	CP33	1	PC06/P66	PC05/P65	PC01/P61			
	5+25	3 0'	C24	4" OD PCC CORE-P	CP24	2						
	5+24 5	3 5'	C24	4" OD PCC CORE-G	CP34	2	PC06/P66	PC02/P62				

TABLE 8
PA SPS-6 DURING-CONSTRUCTION SAMPLING - TRACKING TABLE, AC BULK SAMPLES
PA DOT LABORATORY

LTPP SECTION I D	MONITOR STA	OFFSET ft'	LOCATION NO	SAMPLE SIZE & TYPE	SAMPLE NO	LAB TEST	LABORATORY TEST SEQUENCE					
							FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH
ASPHALT MIXES 9/29/92			BV01	65 lb - BCBC	BA01		AC03/P03	AC04/P04	AC05/P05	AG04/P14	AG01/P11	AG02/P12
			BV02	65 lb - Binder	BA01		AC03/P03	AC04/P04	AC05/P05	AG04/P14	AG01/P11	AG02/P12
			BV03	65 lb - Wearing H	BA01		AC03/P03	AC04/P04	AC05/P05	AG04/P14	AG01/P11	AG02/P12
			BV01	65 lb - BCBC	BA01		AE01/P21	AE02/P22	AE03/P23	AE04/P24	AE05/P25	
			BV02	65 lb - Binder	BA01		AE01/P21	AE02/P22	AE03/P23	AE04/P24	AE05/P25	
			BV03	65 lb - Wearing H	BA01		AE01/P21	AE02/P22	AE03/P23	AE04/P24	AE05/P25	
ASPHALT CEMENT BINDER - From Tanker				5 gallon pail	3 samples		AE02/P22	AE03/P23	AE04/P24	AE05/P25		

TABLE 9
PA SPS-6 POST-CONSTRUCTION SAMPLING - TRACKING TABLE, AC CORES
FHWA CONTRACTOR LABORATORY (LAW ENG., ATLANTA)

LTPP SECTION I D	MONITOR STA	OFFSET ft'	LOCATION NO	SAMPLE SIZE & TYPE	SAMPLE NO	LAB TEST	LABORATORY TEST SEQUENCE					
							FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH
420606	0-35	3'	C25	4" O D AC CORE-G	CA25	1	AC01/P01	AC02/P02	AC06/P06			
6/13/94	0-35	6'	C26	4" O D AC CORE-G	CA26	1	AC01/P01	AC02/P02	AC06/P06			
	5+30	3'	C27	4" O D AC CORE-G	CA27	2	AC01/P01	AC02/P02	AC06/P06			
	5+30	6'	C28	4" O D AC CORE-G	CA28	2	AC01/P01	AC02/P02	AC06/P06			
420603	0-30	3'	C29	4" O D AC CORE-G	CA29	1	AC01/P01	AC02/P02	AC07/P07			
6/13/94	0-30	6'	C30	4" O D AC CORE-G	CA30	1	AC01/P01	AC02/P02	AC07/P07			
	5+30	3'	C31	4" O D AC CORE-G	CA31	2	AC01/P01	AC02/P02	AC07/P07			
	5+30	6'	C32	4" O D AC CORE-G	CA32	2	AC01/P01	AC02/P02	AC07/P07			
420604	0-30	3'	C33	4" O D AC CORE-G	CA33	1	AC01/P01	AC02/P02	AC07/P07			
6/13/94	0-30	6'	C34	4" O D AC CORE-G	CA34	1	AC01/P01	AC02/P02	AC07/P07			
	5+25	3'	C35	4" O D AC CORE-G	CA35	2	AC01/P01	AC02/P02	AC07/P07			
	5+25	6'	C36	4" O D AC CORE-G	CA36	2	AC01/P01	AC02/P02	AC07/P07			
420607	0-30	3'	C37	4" O D AC CORE-G	CA37	1	AC01/P01	AC02/P02	AC07/P07			
6/13/94	0-30	6'	C38	4" O D AC CORE-G	CA38	1	AC01/P01	AC02/P02	AC07/P07			
	5+25	3'	C39	4" O D AC CORE-G	CA39	2	AC01/P01	AC02/P02	AC07/P07			
	5+25	6'	C40	4" O D AC CORE-G	CA40	2	AC01/P01	AC02/P02	AC07/P07			
420608	0-30	3'	C41	4" O D AC CORE-G	CA41	1	AC01/P01	AC02/P02	AC07/P07			
6/14/94	0-30	6'	C42	4" O D AC CORE-G	CA42	1	AC01/P01	AC02/P02	AC07/P07			
	5+29	3'	C43	4" O D AC CORE-G	CA43	2	AC01/P01	AC02/P02	AC07/P07			
	5+29	6'	C44	4" O D AC CORE-G	CA44	2	AC01/P01	AC02/P02	AC07/P07			
420660	0-30	3'	C45	4" O D AC CORE-G	CA45	1	AC01/P01	AC02/P02	AC07/P07			
6/14/94	0-30	6'	C46	4" O D AC CORE-G	CA46	1	AC01/P01	AC02/P02	AC07/P07			
	5+30	3'	C47	4" O D AC CORE-G	CA47	2	AC01/P01	AC02/P02	AC07/P07			
	5+30	6'	C48	4" O D AC CORE-G	CA48	2	AC01/P01	AC02/P02	AC07/P07			

TABLE 9 (Cont.)
PA SPS-6 POST-CONSTRUCTION SAMPLING - TRACKING TABLE, AC CORES
FHWA CONTRACTOR LABORATORY (LAW ENG., ATLANTA)

LTPP SECTION I D	MONITOR STA	OFFSET ft'	LOCATION NO	SAMPLE SIZE & TYPE	SAMPLE NO	LAB TEST	LABORATORY TEST SEQUENCE					
							FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH
420661	0-30	3'	C49	4" O D AC CORE-G	CA49	1	AC01/P01	AC02/P02	AC07/P07			
6/14/94	0-30	6'	C50	4" O D AC CORE-G	CA50	1	AC01/P01	AC02/P02	AC07/P07			
	5+30	3'	C51	4" O D AC CORE-G	CA51	2	AC01/P01	AC02/P02	AC07/P07			
	5+30	6'	C52	4" O D AC CORE-B	CA52	2	AC01/P01	AC02/P02	AC07/P07			
420662	0-30	3'	C53	4" O D AC CORE-G	CA53	1	AC01/P01	AC02/P02	AC06/P06			
6/14/94	0-30	6'	C54	4" O D AC CORE-G	CA54	1	AC01/P01	AC02/P02	AC06/P06			
	5+30	3'	C55	4" O D AC CORE-G	CA55	2	AC01/P01	AC02/P02	AC06/P06			
	5+30	6'	C56	4" O D AC CORE-G	CA56	2	AC01/P01	AC02/P02	AC06/P06			

TABLE 10
Materials Library Sampling
PA SPS-6, I-80 WBL CENTRE COUNTY

Material and Sample Description	Sample Location	Sample Size	Date Sampled
Asphalt Cement	Mix plant	11-5 gal pails	9/28/92
CO & fine aggregate	Mix plant	4-55 gal drums	9/28/92
Asphalt concrete mix	Mix plant	9-5 gal pails	9/29/92

TABLE 11
SHRP TREATMENT DATES
PA SPS-6, I-80 WBL, CENTRE COUNTY

Section	Overlay Thickness	Type of Treatment	Scratch Course	First Base	Second Base	First Binder	Surface Course
420602		Minimal					
420659		Normal Maint					
420601		Normal Maint					
420605		Intensive					
420606	4"	Intensive				9/30/92	10/1/92
420603	4"	Minimal				9/30/92	10/1/92
420604	4"	Minimal				9/30/92	10/1/92
420607	4"	Break & Seat				9/25/92	10/1/92
420608	8"	Break & Seat	9/23/92	9/25/92		9/28/92	9/29/92
420660	9-1/2"	Rubblize	9/24/92	9/25/92		9/28/92	9/29/92
420661	13"	Rubblize	9/24/92	9/24/92	9/24/92	9/28/92	9/29/92
420662	8"	Break & Seat Saw 3rd pts	9/23/92	9/24/92		9/28/92	9/29/92

Weather Notes on Paving Dates

9/23/92	Clear, cool
9/24/92	Sunny, cool
9/25/92	Sunny, cool 60 deg F
9/28/92	Clear, warm, 70 deg F
9/29/92	Partly cloudy, windy
9/30/92	Cloudy, cool breeze
10/1/92	Sunny, warm

TABLE 12
AGGREGATE BLENDS FOR
PA SPS-6 I-80 WBL, CENTRE COUNTY

	HD BCBC	HD Binder	HD Wearing
HRI Curtin GPS B-3	36 40%	36 40%	49 20%
HRI Curtin Gap #5			5 50%
HRI Curtin Gap #8	11 50%	11 50%	19 60%
HRI Curtin Gps #57	28 80%	28 70%	
HRI Curtin Gap #57 sp	19 20%	19 20%	
Lycoming Fairfield #8			19 60%
Asphalt Content (Total)	4 10%	4 20%	6 1%

TABLE 13
SPS-6 MIX DESIGNS AND PLANT REPORTS
BASE COURSE
(TOTAL PERCENT PASSING EACH SIEVE)

		MIX TYPE - Heavy Duty BCBC (5 0AV)						
		JOB MIX		HOT BINS				
SIEVE SIZE	JMF	TOLERANCE		1	2	3	4	COMB
2	100	100	100					
1-1/2	100	92	100				100	
1	92	84	100				97 5	
3/4						100	79 6	
1/2	63	55	71			98	20 2	
3/8	55	47	63		100	72 3	3 5	
#4	40	32	48	100	88 5	1 5	1	
#8	30	24	36	95 4	20	0 5	0 8	
#16	19	13	25	66 6				
#30	13	7	19	44 7				1 5
#50	9	3	15	33 1				1
#100	7	1	13	17 5				0 75
#200	4 5	1 5	7 5	5 7				0 5
% AC in RAP								
% AC								
Total AC	4 1	3 3	4 9					
Type AC	AC20							
AC Source	Sun Refin							
MARSHALL Design								
Max SP GR	2 598							
Aparent SP GR	2 455							
Optimum AC%	4 1							
% Air Voids	4 9							
Stability, lbs	3283							
* Blows	75							
Flow	9 3							

TABLE 14
SPS-6 MIX DESIGNS AND PLANT REPORTS
BINDER COURSE
(TOTAL PERCENT PASSING EACH SIEVE)

		MIX TYPE - Heavy Duty ID-2 Binder						
		JOB MIX		HOT BINS				
SIEVE SIZE	JMF	TOLERANCE		1	2	3	4	COMB
2	100	100	100					
1-1/2	100	92	100				100	
1	92	84	100				97 5	
3/4						100	79 6	
1/2	63	55	71			98	20 2	
3/8	55	47	63		100	72 3	3 5	
#4	40	32	48	100	88 5	1 5	1	
#8	30	24	36	95 4	20	0 5	0 8	
#16	19	13	25	66 6				
"#30	13	7	19	44 7				1 5
#50	9	3	15	33 1				1
#100	7	1	13	17 5				0 75
#200	4 5	1 5	7 5	5 7				0 5
% AC in RAP								
% AC								
Total AC	4 1	3 3	4 9					
Type AC	AC20							
AC Source	Sun Refin							
MARSHALL Design								
Max SP GR	2 598							
Aparent SP GR	2 455							
Optimum AC%	4 1							
% Air Voids	4 9							
Stability, lbs	3283							
* Blows	75							
Flow	9 3							

TABLE 15
SPS-6 MIX DESIGNS AND PLANT REPORTS
SURFACE COURSE
(TOTAL PERCENT PASSING EACH SIEVE)

		MIX TYPE - Heavy Duty ID-2 Wearing, SRL "H"						
		JOB MIX		HOT BINS				
SIEVE SIZE	JMF	TOLERANCE		1	2	3	4	COMB
1/2	100	100	100			100		
3/8	95	87	100		100	98 9		
#4	66	58	74	100	81 2	12 1		
#8	42	36	48	95 6	18	3 5		
#16	25	19	31	73 5				
#30	16	10	22	52 3				1 5
#50	11	5	17	38 6				1
#100	8	2	14	20 3				0 75
#200	5	2	8	7 8				0 5
% AC in RAP								
% AC								
Total AC	6 1	5 4	6 8					
Type AC	AC20							
AC Source	Sun Refin							
MARSHALL Design								
Max SP GR	2 491							
Aparent SP GR	2 385							
Optimum AC%	6 1							
% Air Voids	4 4							
Stability, lbs	3017							
* Blows	75							
Flow	12							

TABLE 16
CONSTRUCTION DATA SUMMARY

	Section	Date	Paving Time		Mix Temp		Air Temp
			Start	Finish	At Plant deg F	Laydown deg F	deg F
First	420662	09/24/92	9 40 AM	10 45 AM	300	280	45
Base	420661	09/24/92	3 10 PM	4 32 PM	300	283	60
Course	420660	09/25/92	2 02 PM	3 15 PM	305	288	62
	420608	09/25/92	4 04 PM	4 55 PM	300	285	62
Second							
Base	420661	09/25/92	11 35 AM	1 03 PM	305	290	50
Course							
	420662	09/28/92	5 01 PM	6 25 PM	305	285	72
	420661	09/28/92	3 53 PM	4 34 PM	302	285	70
	420660	09/28/92	2 05 PM	3 07 PM	300	276	70
Binder	420608	09/28/92	12 00 PM	12 35 PM	307	275	65
Course	420607	09/25/92	9 30 AM	9 50 AM		250	40
	420604	09/30/92	3 20 PM	3 34 PM	300	290	
	420603	09/30/92	3 38 PM	3 50 PM	300	278	50
	420606	09/30/92	3 53 PM	4 04 PM		280	50
	420662	09/29/92	12 35 PM	1 05 PM	305	287	55
	420661	09/29/92	1 29 PM	2 04 PM	305	285	55
	420660	09/29/92	2 23 PM	2 52PPM	300	286	58
AC	420608	09/29/92	3 20 PM	4 06 PM	305	287	60
Surface	420607	10/01/92	10 30 AM	10 56 AM	305	285	50
Course	420604	10/01/92	11 00 AM	11 27 AM	305	287	50
	420603	10/01/92	11 39 AM	12 10 PM	300	290	50
	420606	10/01/92	12 20 PM	12 50 PM	300	290	50

TABLE 17
SPS-6 PA DOT, I-80 WB - PAVEMENT STRUCTURES

	EXISTING		A.C. OVERLAY				
TEST SECTION ID	GRAN. BASE INS.	PCC SURFACE INS.	LEVELLING COURSE INS.	ID 2 BINDER INS.	ID 2 WEARING INS.	AVG. TOTAL (LEVELS)	DESIGN INS.
420606	9.0"	10.0"	---	2.8"	1.9"	4.3"	4.0"
420603	9.0"	10.1"	---	2.4"	1.7"	3.8"	4.0"
420604	9.0"	10.2"	---	2.3"	1.9"	4.2"	4.0"
420607	9.0"	10.1"	---	2.5"	1.8"	4.1"	4.0"
420608	9.0"	10.1"	1.4"	5.7"	1.8"	8.5"	8.0"
420660	9.0"	10.6"	0.9"	6.4"	1.7"	9.6"	9.5"
420661	9.1"	9.9"	1.2"	10.7"	1.7"	13.3"	13.0"
420662	9.0"	10.1"	---	5.8"	1.8"	8.2"	8.0"

Subgrade: Silt
Base: Crushed Limestone
Pavement: Jointed Reinforced PC Concrete

PHOTO #1
Typical Spalling Distress and Joint Seal Damage

PHOTO #2 Faulting Distress

PHOTO #3
Test Pit Sampling and Testing at Full-Depth Patches

PHOTO #4 TP-4 Measurements

PHOTO #5
Sub-Sealing at Full CPR Surface Preparation Site

PHOTO #6
Cleaning Debris for Partial Depth Patching

PHOTO #7
Placing Concrete for Partial Depth Patch

PHOTO #8
Removing Slab for Full Depth Patch

PHOTO #9
Full Depth Patch Repairs with Load Transfer Restored

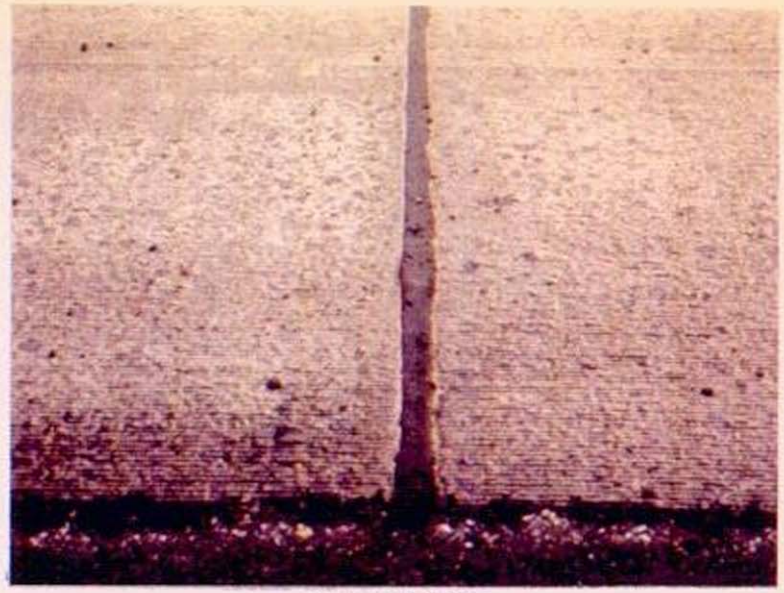


PHOTO #10
Intensive Diamond Grinding Surface Preparation

PHOTO #11
Diamond Grinding Equipment Train

PHOTO #12
Break-and-Seat Guillotine Equipment

PHOTO #13 Seating Proof Roller

PHOTO #14
Rubblizing Pavement Breaker

PHOTO #15
Pavement after Rubblizing

PHOTO #16
Product of Rubblizing Operation

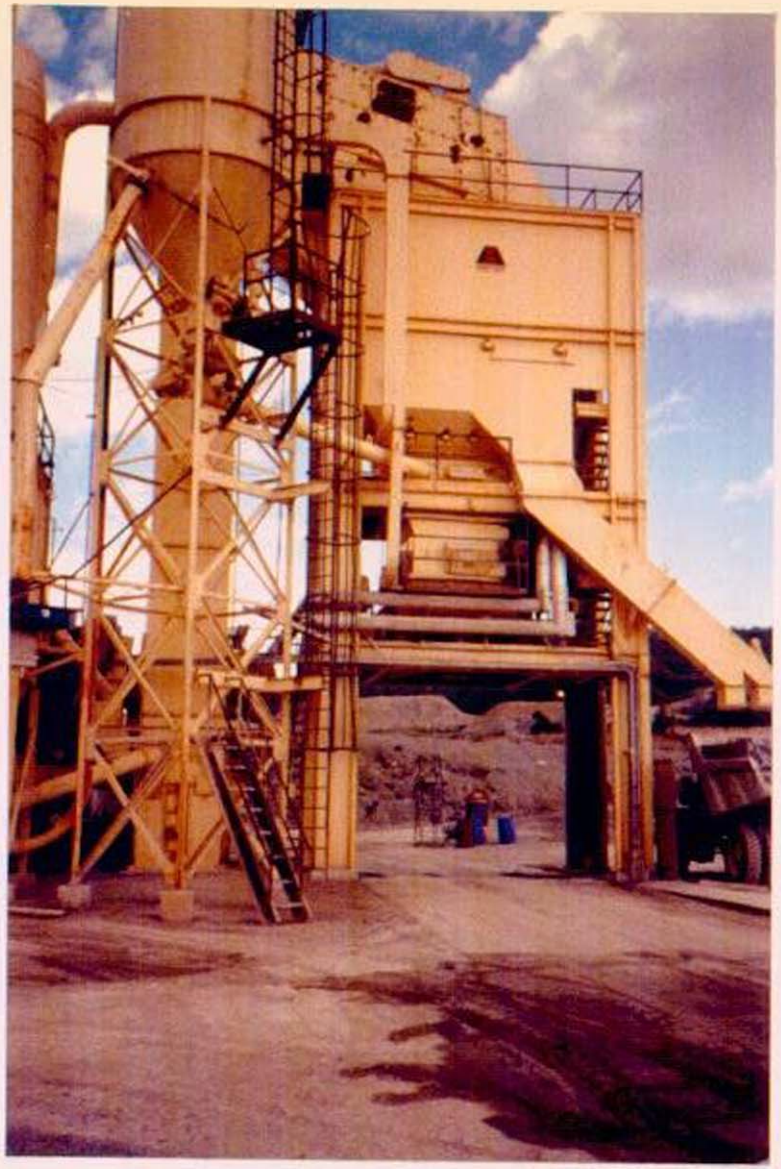


PHOTO #18 Batch Plant

PHOTO #17
Fabric-Wrapped Pavement Edge
Plastic Pipe Drain

PHOTO #19
Two-Lane Wide Paver with
Virign Base Course Mix

PHOTO #20
Paving with Surface Course Mix
Two Lanes Wide

PHOTO #21
Compacting the Asphalt Mixes with
10 Ton Steel Wheel Vibratory Rollers

PHOTO #22
Measuring the Roughness of the Pavement with a
Profilograph