File NC SPS-2

PAVEMENT
MANAGEMENT
SYSTEMS

July 13, 1993
50450910-13.2

Ms. Judith Corley-Lay
Pavement Management Section
Century Center
North Carolina Department of Transportation
P.O. Box 25201
Raleigh, North Carolina 27611

RE: Revised SPS-2 Layout and Materials Sampling and Testing Plans

Dear Shin-Wu,

In a June 22nd memo on the above subject, I had indicated the need for a complete revision of the field materials sampling and testing plan due to the rearrangements of test sections and the addition of a second supplemental section.

Forwarded herewith are the following revised layout and field materials sampling and testing plans:-

Table 1 - NC DOT SPS-2 Test Section Layout, (1 sheet)	June 18/93
Table 2 - Field and Laboratory Materials Testing Plan, (3 sheets)	June 22/93
Table 3 - Materials Sampling Requirements, (1 sheet)	June 22/93
Field Materials Sampling and Testing	July 5/93
Subgrade	
Dense Graded Aggregate Base	
Lean Concrete Base	
Permeable Asphalt Treated Base	
Portland Cement Concrete	
Sampling and Testing Plan for Section 370201-12, 370259, and 370260	July 5/93
Schedule for Post-Construction Coring of PCC & LCB (5 sheets)	July 1/93

415 LAWRENCE BELL DRIVE
UNIT #3
AMHERST, N Y 14221
TEL (716) 632-0804
FAX (716) 632-4808

These revisions essentially only change the sample numbers but not the scope or extent of sampling and testing, except as a result of the addition of another supplemental section.

Your cooperation in facilitating these revisions is greatly appreciated. Should there be any questions, please do not hesitate to call.

Yours Sincerely,
PAVEMENT MANAGEMENT SYSTEMS LTD.

William A. Phang

W. A. Phang, D. Eng.
Program Manger, FHWA-LTPP

BP/tf

c.c. I.J. Pecnik w/o encl.
M. Symons
S. Tayabji
A. Rutka

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July 13, 1993
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Mr. Shin-Wu
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P.O. Box 25201
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TABLE 1

NC DOT SPS-2: Test Section Layout: US 52 SB, Lexington

Station	Length Ft.	Sec. No.	Concrete Pav't Flexural Strength	Concrete Pav't Thickness Inches	Lane Width Ft.	BASE Type	BASE Thickness Inches	Typical Section	Remarks	Monitor Station	Suggested Construction Station
130+70										5	137+00
	1230'	N4	900	11"	12'	ABC	6"	E		0	142+00
143+00											
						PADL	4"		edge		
214+00	7100'			10"	12'	AC	1"	G	drain		
	700'	N8	900	11"	12'	LCB	6"	F		5	215+00
221+00										0	220+00
	850'	N12	900	11"	12'	PADL	4"	A	edge	5	222+00
229+50						ABC	4"		drain	0	227+00
	914.8'	N11	550	11"	14'	PADL	4"	A	edge	5	231+15
238+64.8						ABC	4"		drain	0	236+15
240+48.3											
	751.7'	60	550	11"	14'	HB	5"	G	edge	5	242+00
248+00									drain	0	247+00
	700'	N7	550	11"	14'	LCB	6"	F		5	249+00
255+00										0	254+00
										5	256+00
262+00	700'	N3	550	11"	14'	ABC	6"	E		0	261+00
	1500'	N6	900	8"	14'	LCB	6"	D*		5	271+00
277+00										0	276+00
	700'	N2	900	8"	14'	ABC	6"	C*		5	278+00
284+00										0	283+00
	700'	N10	900	8"	14'	PADL	4''	B*	edge	5	285+00
291+00						ABC	4"		drain	0	290+00
	700'	N9	550	8"	12'	PADL	4"	B*	edge	5	292+00
298+00						ABC	4"		drain	0	297+00
	700'	N1	550	8"	12'	ABC	6"	C*		5	299+00
305+00										0	304+00
	1300'	N5	550	8"	12'	LCB	6"	D*		5	306+00
318+00										0	311+00
	6500'	59		10"	12'	PADL	4"	G	edge	5	328+00
387+00						AC	1"		drain	0	333+00

* ADD-ON LANE

TABLE 2
NC DOT SPS-2: Field and Laboratory Materials Testing Plan

Material Type and Properties	SHRP Test Designation	SHRP Protocol	Tests Per Layer	Materials Source/ Test Location	Comments
SUBGRADE					
Sieve Analysis	SS01	P51	6	B1-B6	
Hydrometer to 0 01mm	SS02	P42	6	B1-B6	
Atterberg Limits	SS03	P43	6	B1-B6	
Classification and Type of Subgrade	SS04	P52	24	A1-A18, B1-B6, Note 1	Visual manual classification ONLY
Moisture-Density Relations	SS05	P55	6	B1-B6	
Resilient Modulus	SS07	P46	6	A2, A5, A8, A11, A14, A17	
Unit Weight	SS08	P56	18	A1-A18	
Natural Moisture Content	SS09	P49	6	B1-B6	
Unconfined Comp Strength	SS10	P54	6	A1, A4, A7, A10, A13, A16	
Permeability	SS11	P57	3	B1, B4, B6	
In-Place Density		SHRP-LTPP	48	B1-B6, T1-T39	
Depth to Rigid Layer		SHRP-LTPP	14	S1-S14	
Plate Bearing Test	SS13	P59	2	T5, T38	FWD or Plate Test
UNBOUND GRANULAR BASE					
Particle Size Analysis	UG01	P41	3	B7, B8, B9	
Sieve Analysis (washed)	UG02	P41	3	B7, B8, B9	
Atterberg Limits	UG04	P43	3	B7, B8, B9	
Moisture-Density Relations	UG05	P44	3	B7, B8, B9	
Resilient Modulus	UG07	P46	3	B7, B8, B9	
Classification	UG08	P47	3	B7, B8, B9	
Permeability	UG09	P48	3	B7, B8, B9	
Natural Moisture Content	UG10	P49	3	B7, B8, B9	
In-Place Density		SHRP-LTPP	27	T43-T69	
Plate Bearing Test	SS13	P59	4	T44, T53, T56, T68	FWD or Plate Test
PERMEABLE ASPHALT TREATED BASE					
Core Examination/Thickness	AC01	P01			Cores will likely not be obtainable
Bulk Specific Gravity	AC02	P02			
Maximum Specific Gravity	AC03	P03	3	BT-01, BT-02, BT-03	
Asphalt Content (extraction)	AC04	P04	3	BT-01, BT-02, BT-03	
Moisture Susceptibility	AC05	P05	3	BT-01, BT-02, BT-03	
Resilient Modulus	AC07	P07			Cores will likely not be obtainable
Indirect Tensile Strength	AC07	P07			
Permeability/Flow	TBA	TBA	0	Not Required	
Plate Bearing Test	SS13	P59	3	T70-T72	

TABLE 2 (cont.)
NC DOT SPS-2: Field and Laboratory Materials Testing Plan

Material Type and Properties	SHRP Test Designation	SHRP Protocol	Tests Per Layer	Materials Source/ Test Location	Comments
LEAN CONCRETE BASE					
Compressive Strength	PC01	P61			
14 day			6	C1-C6	Obtain C cores for 14 day testing 10-13 days after placement
28 day			4	C20, C60, C77, C109	
1 year			4	C"19, C"59, C"76, C"108	Use LCB portion of C and C" cores for 28 day and 1 year testing
PORTLAND CEMENT CONCRETE AS PLACED					
Compressive Strength	PC01	P61			
14 day			14	C7, C16, C24, C32, C40, C48, C56, C64 C73, C81, C89, C97, C105, C113	Obtain C cores for 14 day testing 10-13 days after placement
28 day			14	C'8, C'17, C'25, C'33, C'41, C'49, C'57 C'65, C'74, C'82, C'90, C'98, C'106, C'114	Obtain C' cores for 28 day testing 21-24 days after placement
1 year			14	C"13, C"22, C"30, C"38, C"46, C"54, C"62 C"70, C"79, C"87, C"95, C"103, C"111, C"119	Obtain C" cores for 1 year testing 350-360 days after placement
Splitting Tensile Strength	PC02	P62			
14 day			14	C11, C20, C28, C36, C44, C52, C60, C68 C77, C85, C93, C101, C109, C117	Obtain C cores for 14 day testing 10-13 days after placement
28 day			14	C'12, C'21, C'29, C'37, C'45, C'53, C'61 C'69 C'78, C'86, C'94, C'102, C'110, C'118	Obtain C' cores for 28 day testing 21-24 days after placement
1 year			14	C"10, C"19, C"27, C"35, C"43, C"51, C"59, C"67 C"76, C"84, C"92, C"100, C"108, C"116	Obtain C" cores for 1 year testing 350-360 days after placement
PCC Unit Weight	PC05	P65	42	CORES FOR COMPRESSIVE STRENGTH TESTING	
Static Modulus of Elasticity	PC04	P64			
28 day			14	C'9, C'18, C'26, C'34, C'42, C'50, C'58, C'66 C'75, C'83, C'91, C'99, C'107, C'115	Obtain C' cores for 28 day testing 21-24 days after placement
1 year			14	C"14, C"23, C"31, C"39, C"47, C"55, C"63, C"71 C"80, C"88, C"96, C"104, C"112, C"120	Obtain C" cores for 1 year testing 350-360 days after placement
Air Content	PC08	P68			
28 day			3	C'9, C'66, C'115	Obtain C' cores for 28 day testing 21-24 days after placement
PCC Coefficient of Thermal Expansion	PC03	P63	3	C'15, C'72, C'121	Obtain C' cores for 28 day testing 21-24 days after placement

TABLE 2 (cont.)
NC DOT SPS-2: Field and Laboratory Materials Testing Plan

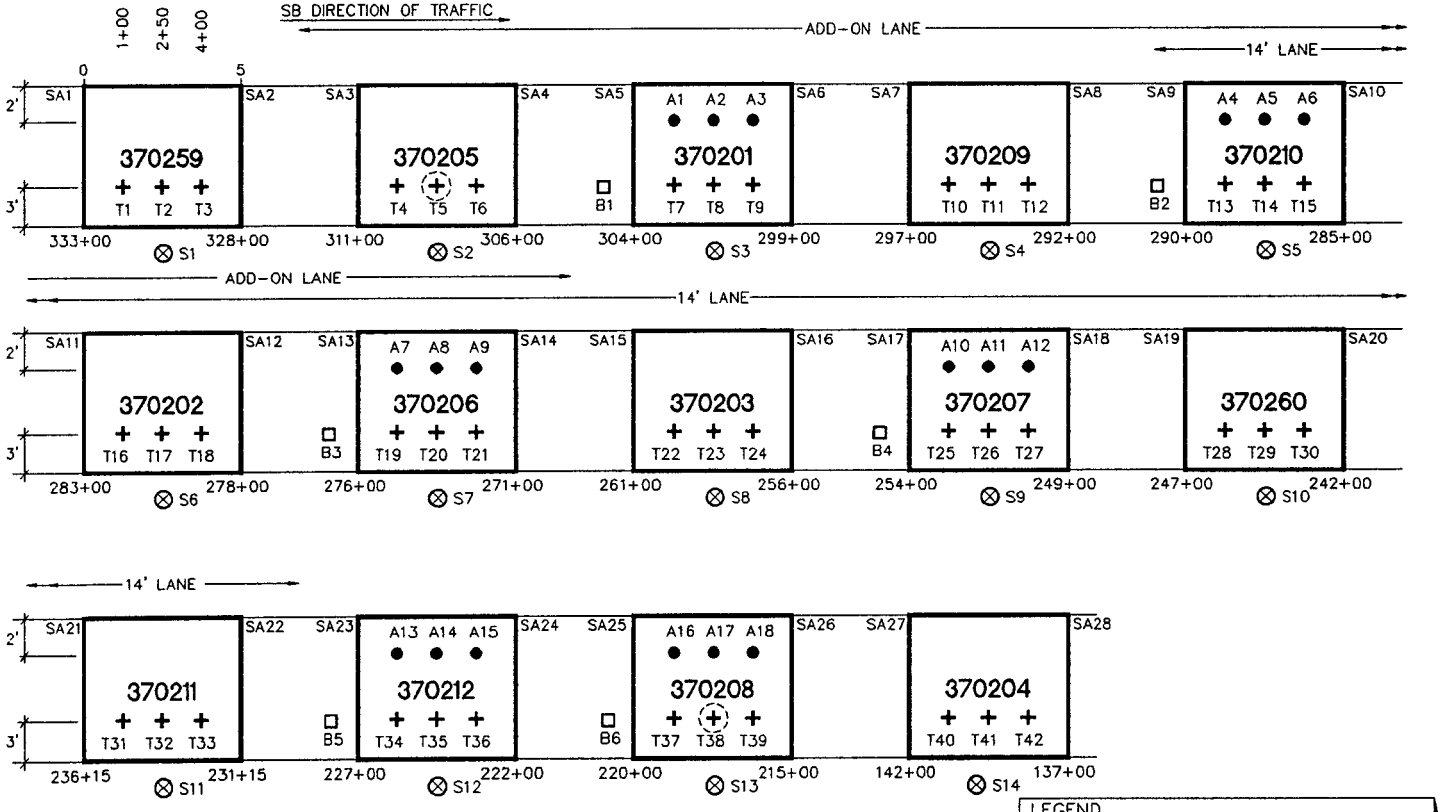
Material Type and Properties	SHRP Test Designation	SHRP Protocol	Tests Per Layer	Materials Source/ Test Location			Comments
LEAN CONCRETE BASE							
AS DELIVERED	PC01	P61					
Compressive Strength							
7 day			6	BP1, BP2			Mold 9-6" diameter x 12"
28 day			6	BP1, BP2			specimen from each
1 year			6	BP1, BP2			sample BP1, BP2
PORTLAND CEMENT CONCRETE				550 psi Flexural Strength Concrete	900 psi Flexural Strength Concrete	3000 psi Compr Strength	
AS DELIVERED							
Compressive Strength	PC01	P61					
14 day			6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	Mold 6-6" diameter x 12"
28 day			6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	and 3-6x6"x20" beam specimen
1 year			6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	from each sample FC1-FC-7
Splitting Tensile Strength	PC02	P62					
14 day			6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	
28 day			6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	
1 year			6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	
Flexural Strength - Beam	PC09	P69					
14 day			6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	
28 day			6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	
1 year			6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	
Air Content	ASTM	SHRP-LTPP	6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	
Slump	ASTM	SHRP-LTPP	6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	
Temperature	ASTM	SHRP-LTPP	6	FC1, FC2, FC3	FC4, FC5, FC6	FC7	

TABLE 3
NC DOT SPS-2: Material Sampling Requirements

Material and Sample Description	Number of Samples	Sample Location
Portland Cement Concrete		
Coring - 4" diameter cores	115	C7-C121
Bulk Sampling (molded into test specimens)	7	FC1-FC7
Unbound Base/Subbase Layers (per layer)		
Bulk Sampling	3	B7-B9
Moisture content samples	3	B7-B9
Lean Concrete Base		
Coring - 4" diameter cores	6	C1-C6
[sampled together with PCC cores]	[30]	[C'17, C'18, C'21, C'57, C'58, C'61, C'74, C'75, C'78, C'82, C'83, C'86, C'106 C'107, C'110 C"19, C"22, C"23, C"59, C"62, C"63, C"76, C"79, C"80 C"84, C"87, C"88, C"108, C"111, C"112
Bulk Sampling (molded into test specimens)	6	BP-01, BP-02 From Site
Permeable Asphalt Treated Base		
Coring - 4" diameter cores [sampled together with PCC cores]		Cores unlikely to be obtained
Bulk Sampling (100 pounds per sample, uncompacted)	3	BT-01, BT-02, BT-03 From Plant
Subgrade		
Thin-walled tube sampling	36	A1-A18
Splitspoon sampling (to replace any thin-walled tube samples that cannot be obtained)		A1-A18
Bulk Sampling (400 pounds each sample)	6	B1-B6
Moisture Content samples	6	B1-B6
Shoulder Auger Probes (Depth to Rigid Layer)	14	S1-S14

FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

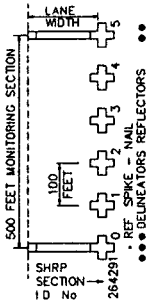
PAVEMENT MANAGEMENT SYSTEMS LIMITED



LEGEND

- □ 2x2 BULK SAMPLE TO 12" BELOW TOP OF SUBGRADE (B1–B6)
- ● SHELBY TUBE/SPLIT SPOON SAMPLING TO 4 BELOW TOP OF SUBGRADE (A1–A18)
- + LOCATION OF NUCLEAR DENSITY/MOISTURE TESTING (T1–T42,B1–B6)
- ⊗ SHOULDER PROBE (S1–S14)
- (+) PLATE LOAD TESTING (T5 T38)

TYPICAL SITE SIGNING & MARKING



ROAD TEST

NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

PLOTDATE. JULY 5/93

SPS–2–1

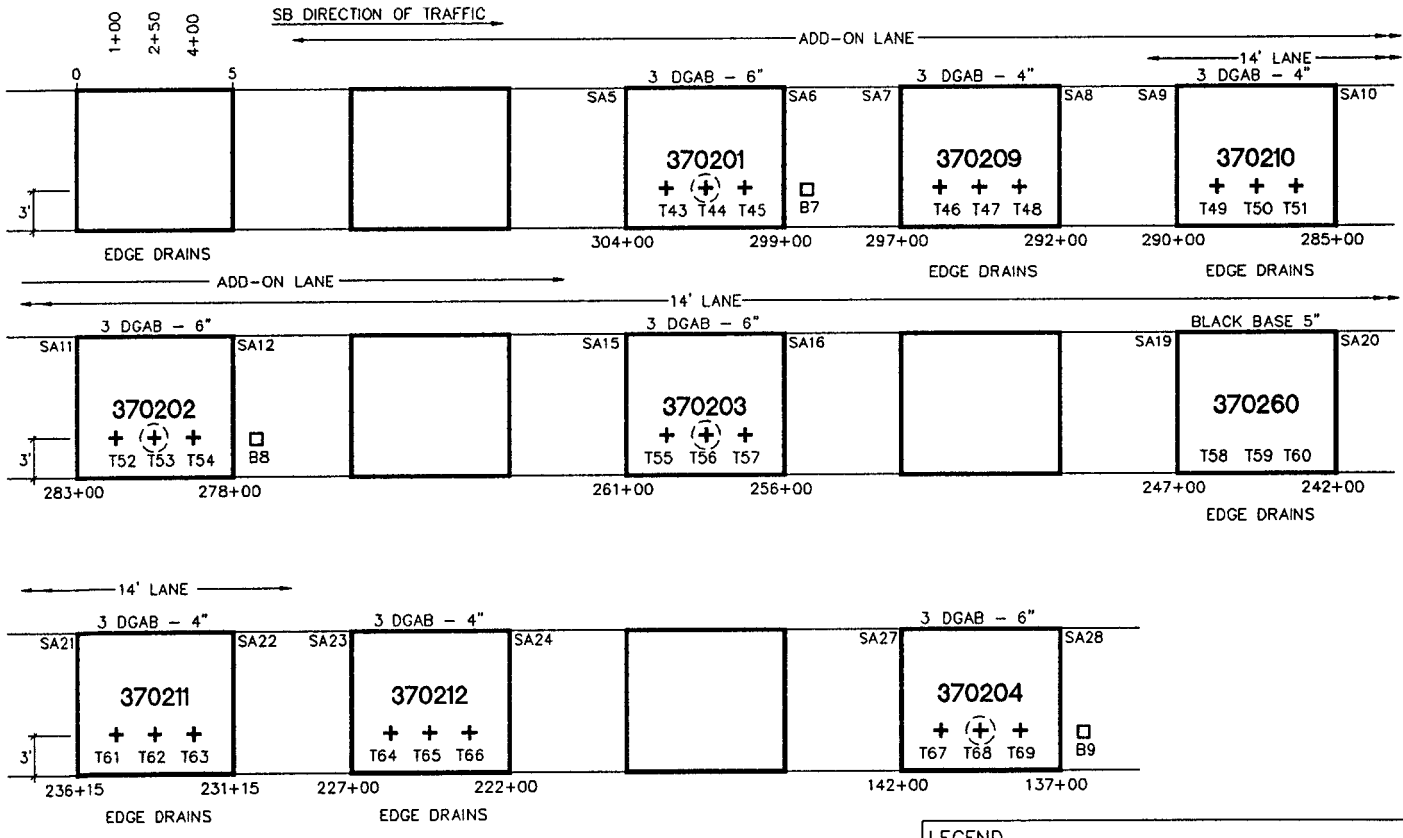
FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

FIELD MATERIALS SAMPLING AND TESTING - SUBGRADE

SPS–2–1

FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



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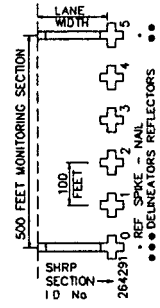


LEGEND

- □ 2x2 BULK SAMPLING LOCATION OF UNCOMPACTED DGAB ONLY (B7–B9)
- + LOCATION OF NUCLEAR DENSITY/MOISTURE TESTING (T43–T69)
- (+) PLATE LOAD TESTING OR FWD (T44,T53,T56 T68)

NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

PLOTDATE: JULY 5/93

SPS–2–2

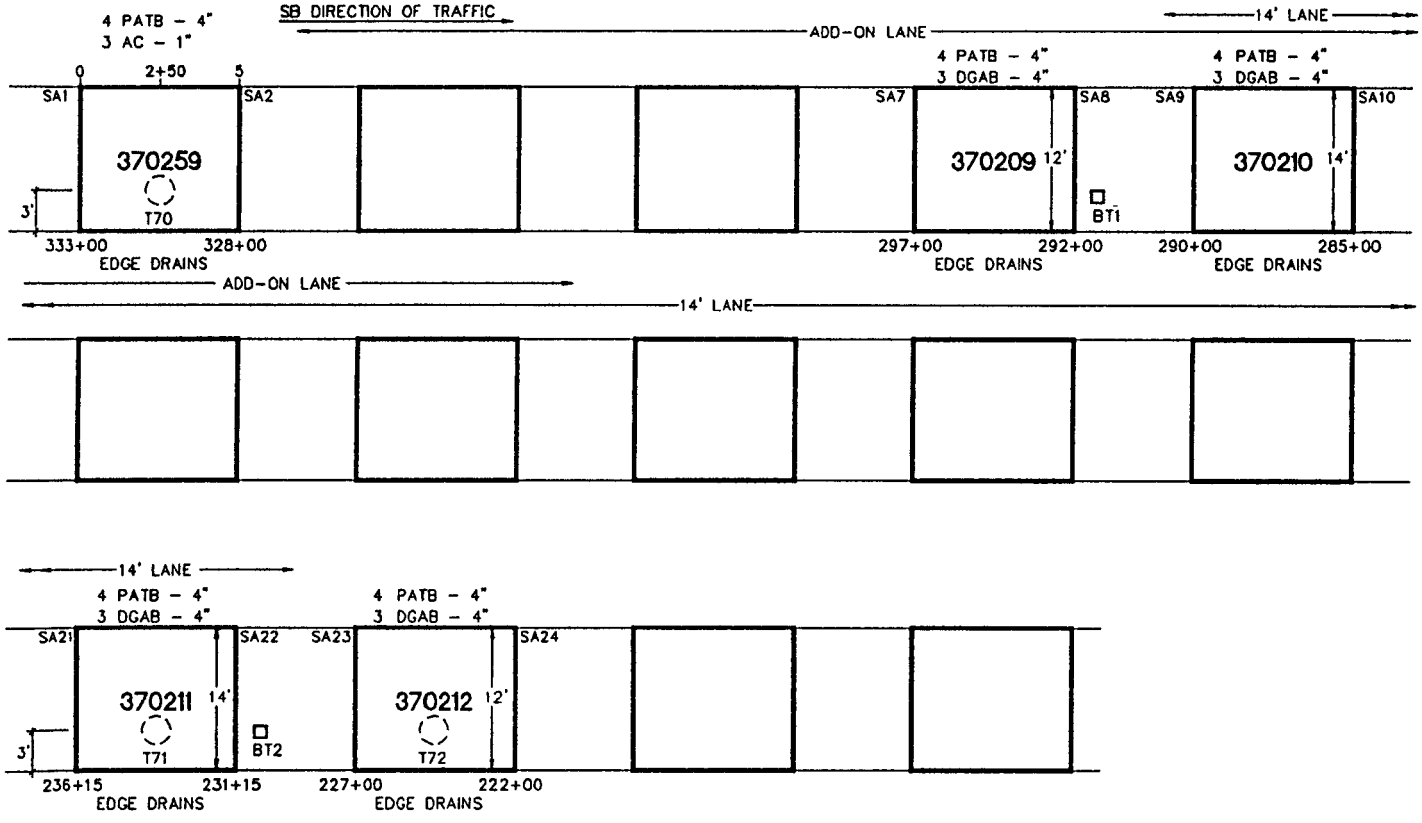
FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

FIELD MATERIALS SAMPLING AND TESTING – DENSE GRADED AGGREGATE BASE

SPS–2–2

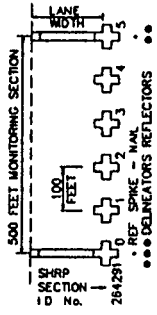
FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



LEGEND
- ☐ BULK SAMPLES FROM PLANT OR FROM UNCOMPACTED PAVEMENT (BT1 BT2)
- ◯ PLATE LOAD OR FWD TESTING (T70 – T72)

TYPICAL SITE SIGNING & MARKING



ROAD TEST

NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

PLOTDATE JUNE 20/93

SPS–2–4

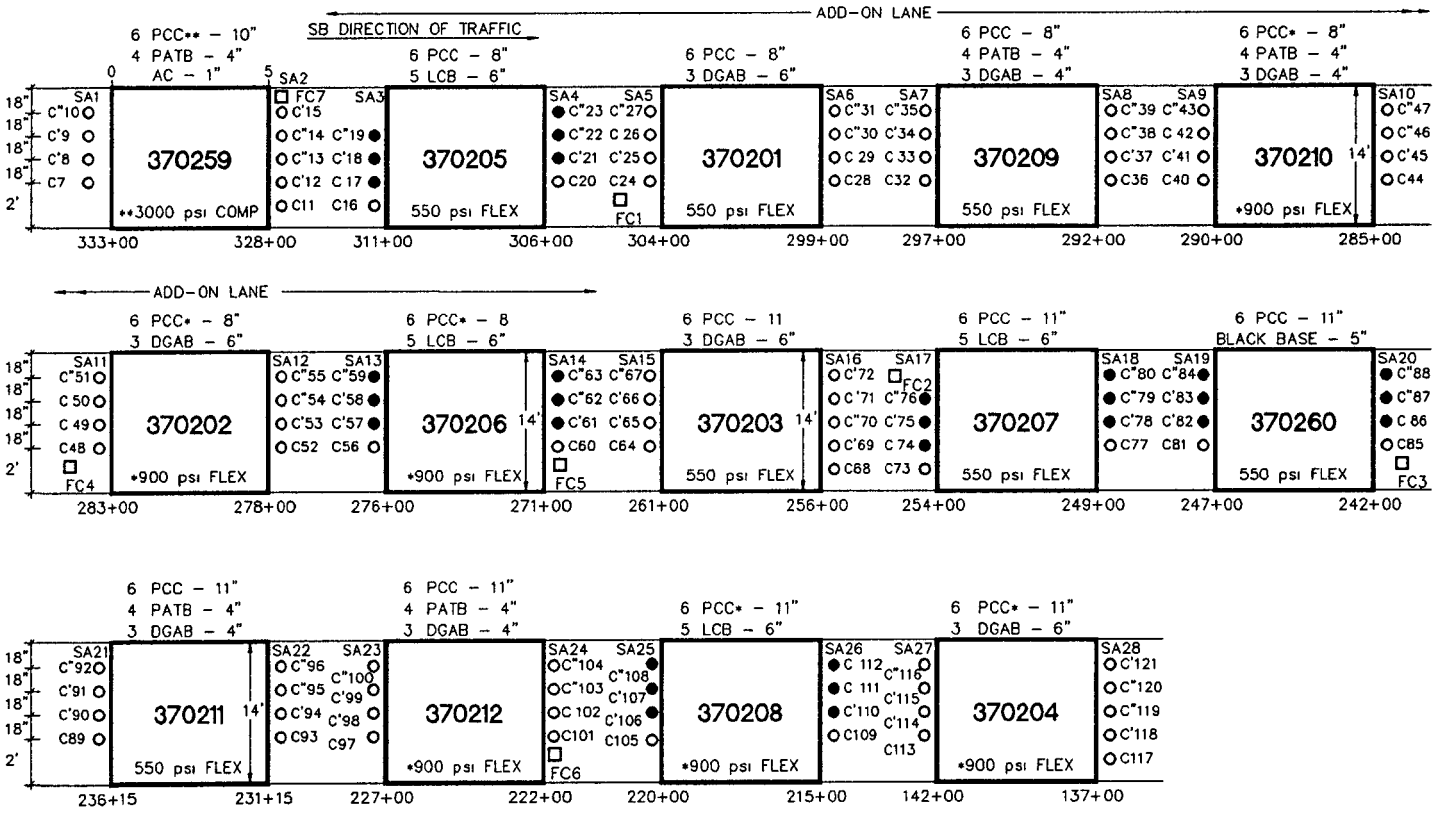
FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

FIELD MATERIALS SAMPLING AND TESTING – PERMEABLE ASPHALT TREATED BASE

SPS–2–4

FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



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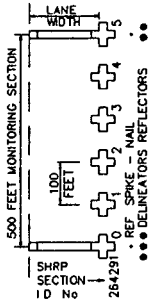


ROAD TEST

LEGEND

- ○ 4" OD CORE OF PCC SURFACE
  - C 10–13 DAYS AFTER PLACEMENT
  - C 21–24 DAYS AFTER PLACEMENT
  - C" 350–360 DAYS AFTER PLACEMENT
- ● 4" OD CORE OF ALL LAYERS
- □ BULK SAMPLES OF PCC AS DELIVERED (FC1–FC7)

FIELD MATERIALS SAMPLING AND TESTING - PORTLAND CEMENT CONCRETE

NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

PLOTDATE: JULY 5/93

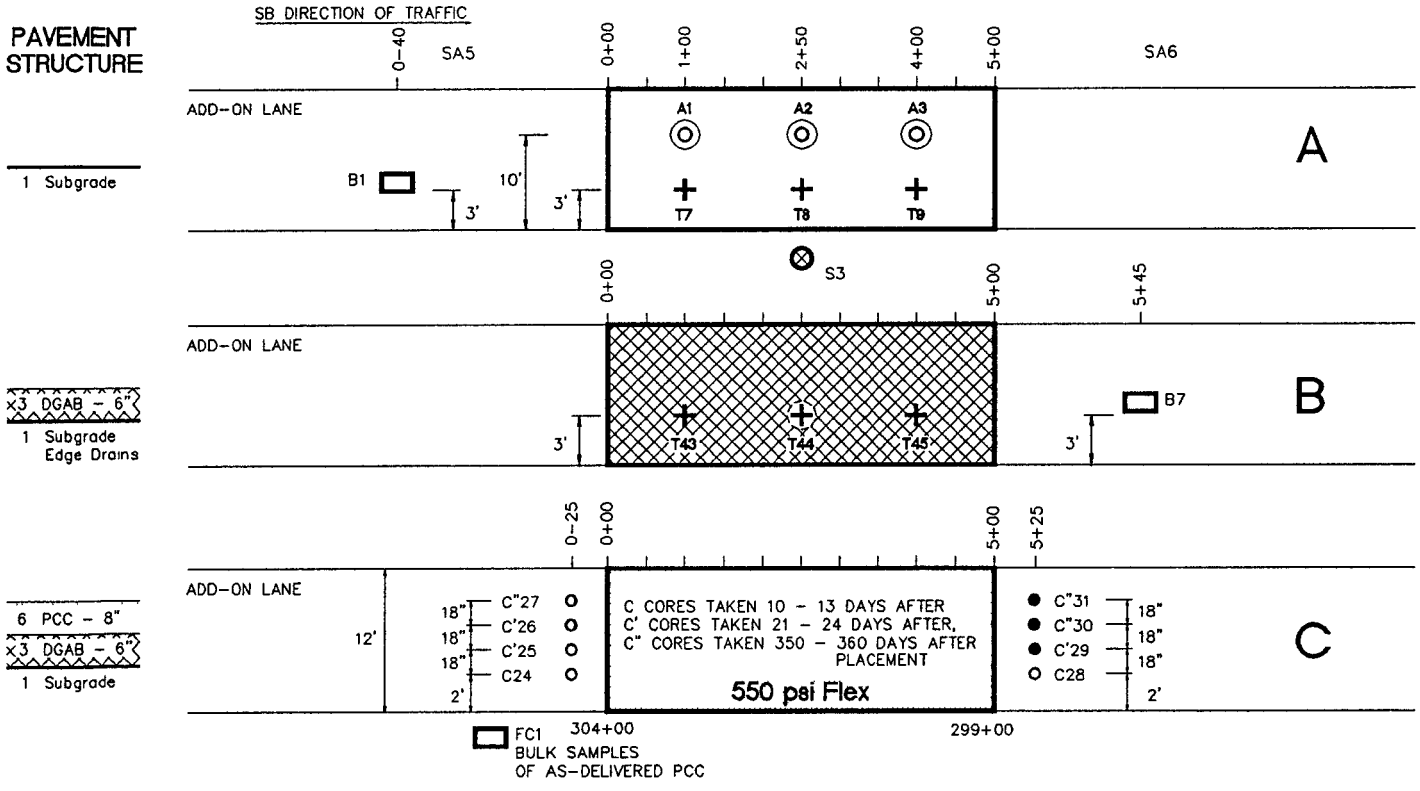
SPS–2–5

FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

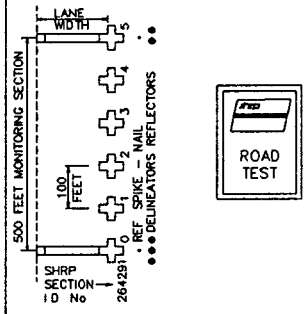
SPS–2–5

FHWA-LTPP SPS-2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



TYPICAL SITE SIGNING & MARKING



A + NUCLEAR DENSITY/MOISTURE TESTING (T7-T9)

◎ SHELBY TUBE/SPLIT SPOON SAMPLES TO 4" DEPTH (A1-A3)

⊗ SHOULDER PROBE (S3)

▭ BULK SAMPLE OF SUBGRADE (B1)

B + NUCLEAR DENSITY OF BLACK BASE LAYER (T43-T45)

▭ BULK SAMPLE OF UNCOMPACTED DGAB (B7)

⊕ PLATE LOAD TESTING (T44)

C ○ 4" OD CORES OF PCC SURFACING ONLY (C24,C28,C'25,C'26,C'29,C"27, C"30,C"31)

▭ BULK SAMPLE OF AS-DELIVERED PCC (FC1) TEST SPECIMEN MOLDED

SAMPLING AND TESTING PLAN FOR SECTION 370201

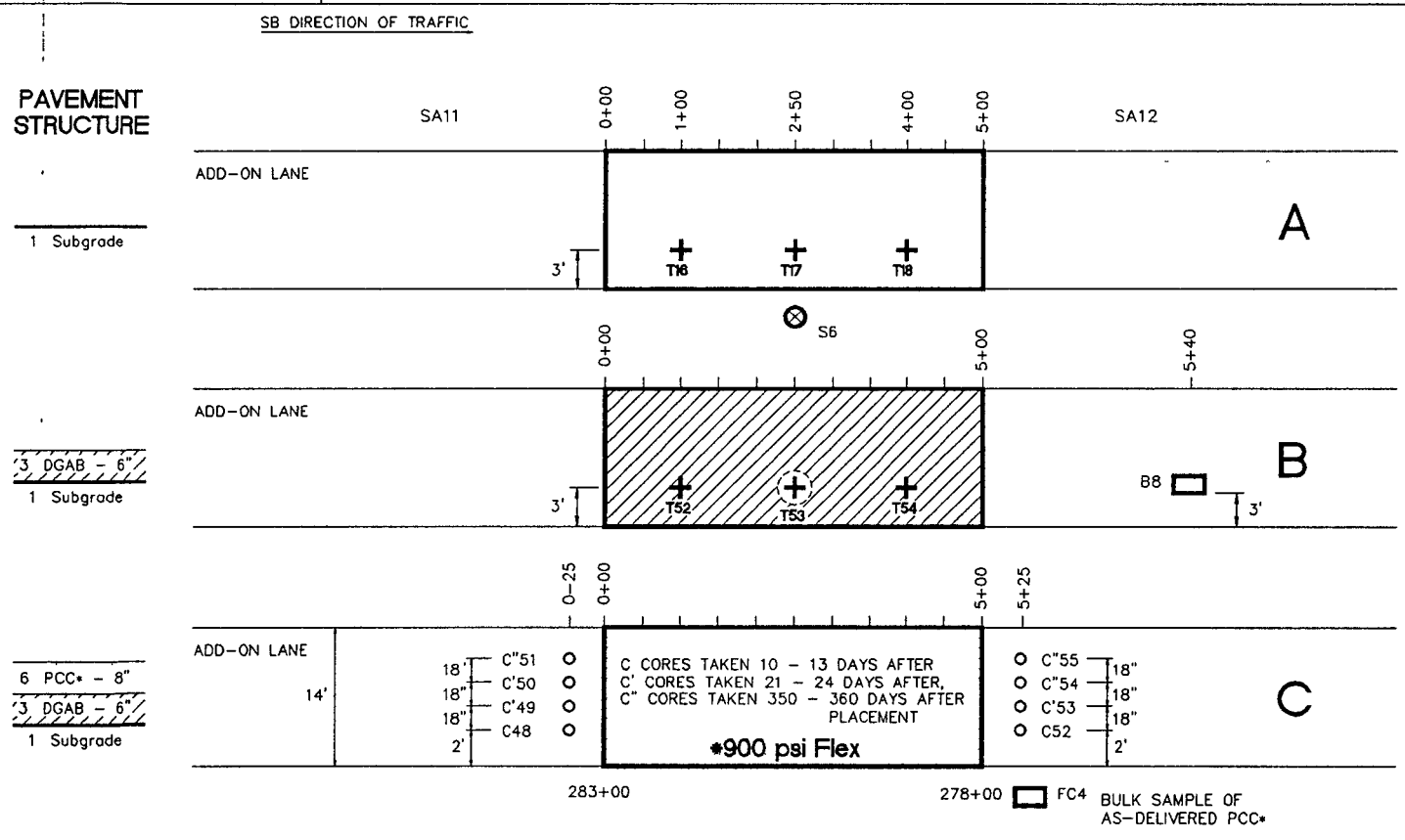
NORTH CAROLINA DOT SPS-2
US 52 SBL LEXINGTON BYPASS

PLOTDATE JULY 3/93

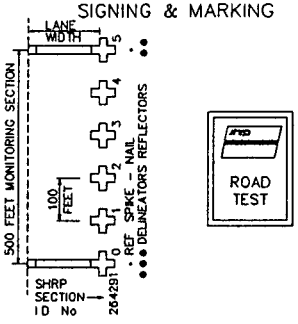
FHWA SPS-2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

FHWA-LTPP SPS-2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



TYPICAL SITE SIGNING & MARKING



A ✚ NUCLEAR DENSITY/MOISTURE TESTING (T16-T18)

⊗ SHOULDER PROBE (S6)

B ✚ NUCLEAR DENSITY/MOISTURE TESTING (T52-T54)

PLATE LOAD TESTING (T53)

▭ BULK SAMPLE OF UNCOMPACTED DGAB (B8)

C ○ 4" O D CORE OF PCC SURFACING ONLY(C48,C52,C'49,C'50,C'53,C"51,C"54 C"55)

▭ BULK SAMPLE OF AS-DELIVERED PCC* (FC4) TEST SPECIMEN MOLDED

SAMPLING AND TESTING PLAN FOR SECTION 370202

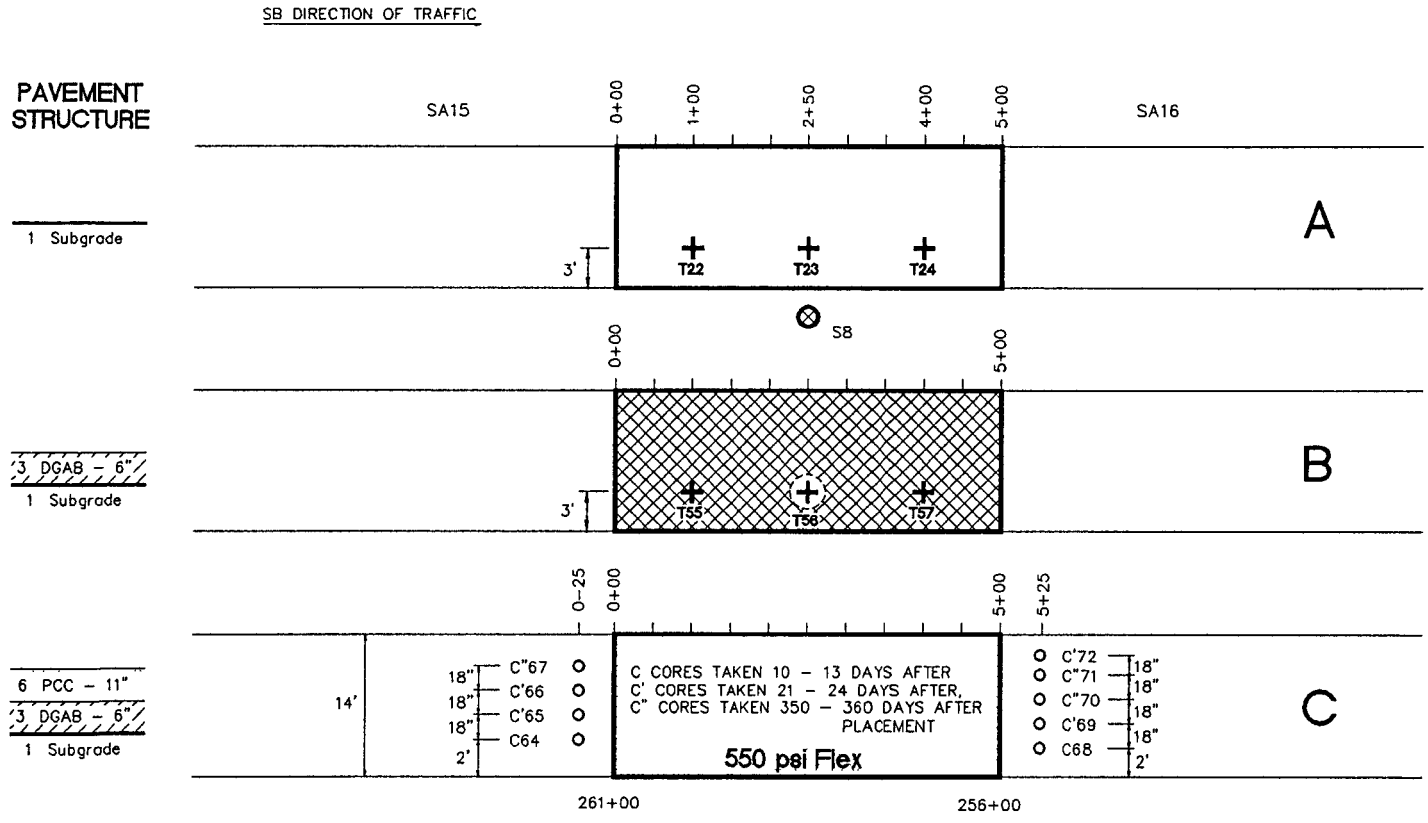
NORTH CAROLINA DOT SPS-2
US 52 SBL LEXINGTON BYPASS

PLOTDATE JULY 5/93

FHWA SPS-2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

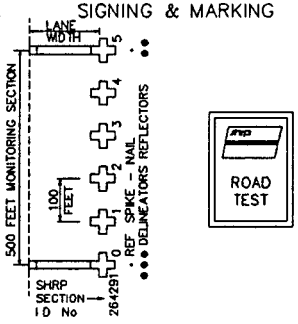
FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



SAMPLING AND TESTING PLAN FOR SECTION 370203.

TYPICAL SITE SIGNING & MARKING



A ✚ NUCLEAR DENSITY/MOISTURE TESTING (T22–T24)

⊗ SHOULDER PROBE (S8)

B ✚ NUCLEAR DENSITY/MOISTURE TESTING (T55–T57)

◯ PLATE LOAD TESTING (T56)

C ○ 4" O D CORE OF PCC SURFACING (C64,C68,C'65,C'66,C'69,C'72,C"67,C"70,C"71)

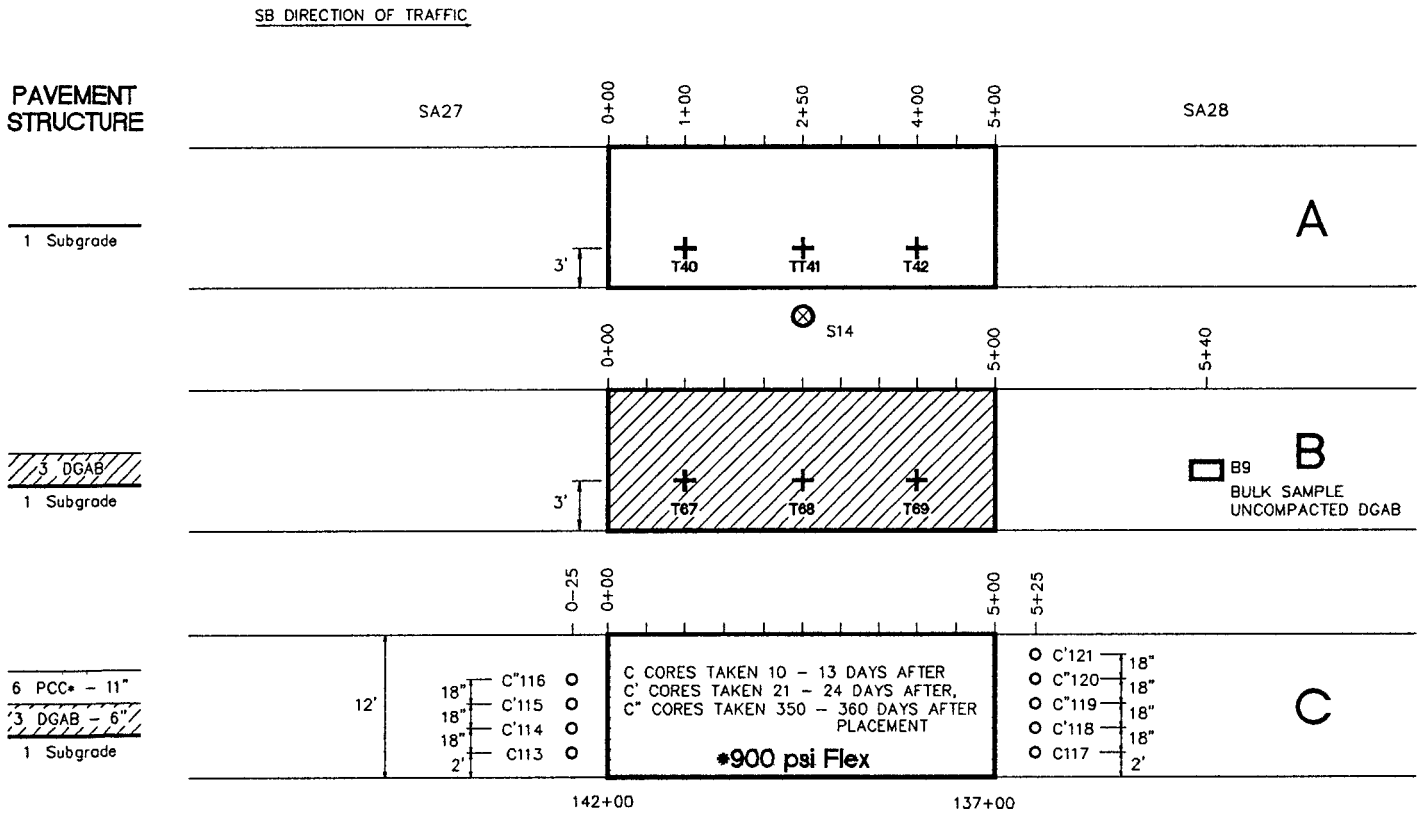
NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

PLOTDATE: JULY 5/93

FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

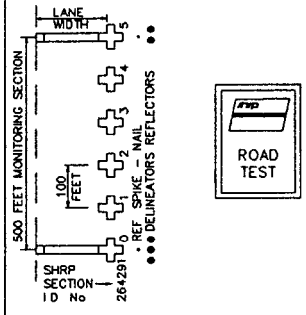
FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



SAMPLING AND TESTING PLAN FOR SECTION 370204

TYPICAL SITE SIGNING & MARKING



A ✚ NUCLEAR DENSITY/MOISTURE TESTING (T40–T42)

⊗ SHOULDER PROBE (S14)

B ✚ NUCLEAR DENSITY/MOISTURE TESTING (T67–T69)
PLATE LOAD TEST (T68)

▭ BULK SAMPLE OF UNCOMPACTED DGAB (B9)

C ○ 4" OD CORES

NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

PLOTDATE: JULY 5/93

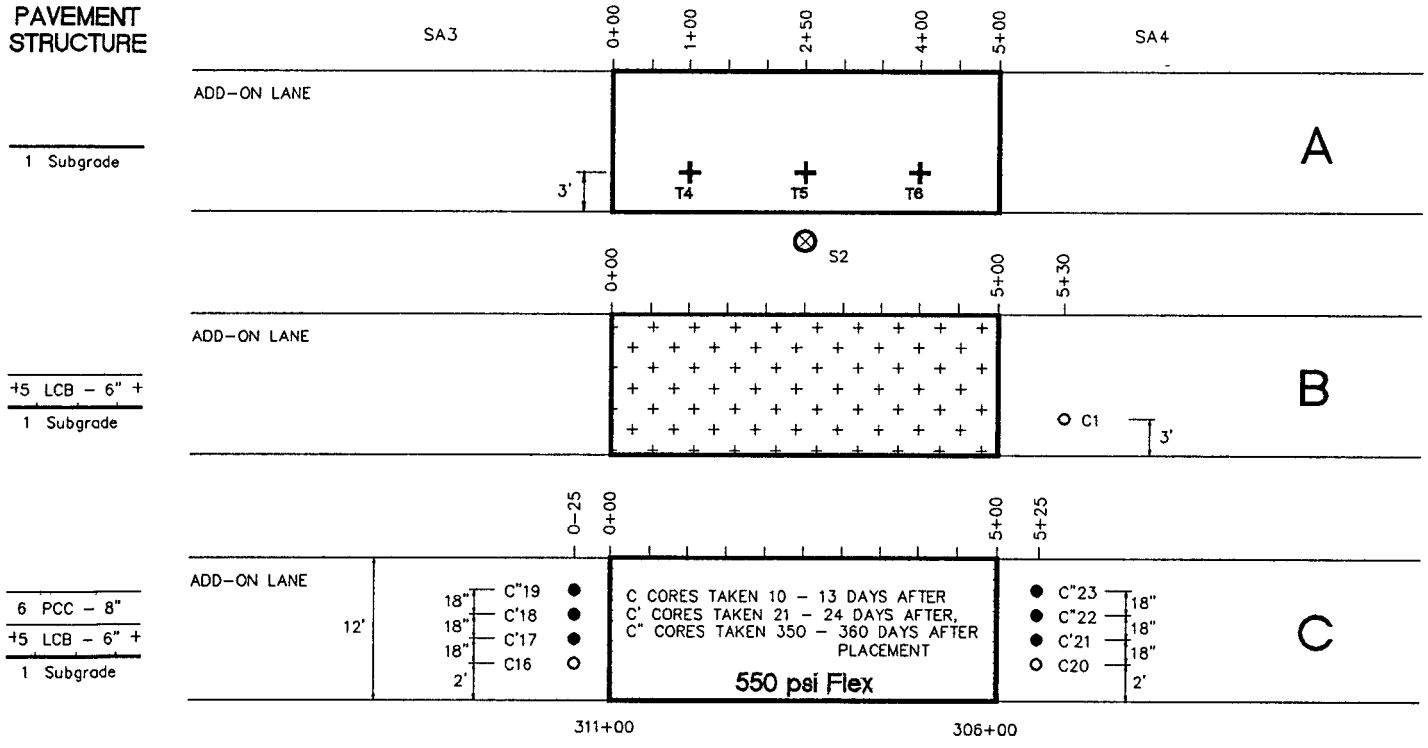
FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

FHWA-LTPP SPS-2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

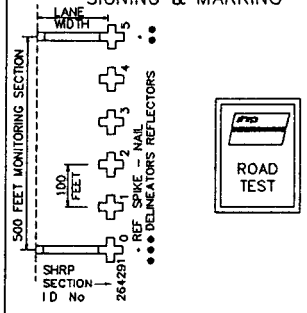
PAVEMENT MANAGEMENT SYSTEMS LIMITED

SB DIRECTION OF TRAFFIC

PAVEMENT STRUCTURE



TYPICAL SITE SIGNING & MARKING



A ✚ NUCLEAR DENSITY/MOISTURE TESTING (T4-T6)

⊗ SHOULDER PROBE (S2)

B ○ 4" O D CORE OF LCB TAKEN 10-13 DAYS AFTER PLACEMENT (C1)

C ○ 4" O D CORE OF PCC SURFACING ONLY (C16,C20)

● 4" O D CORE OF PCC WITH ATTACHED LCB (C'17,C'18,C'21,C"19,C"22 C"23)

SAMPLING AND TESTING PLAN FOR SECTION 370205

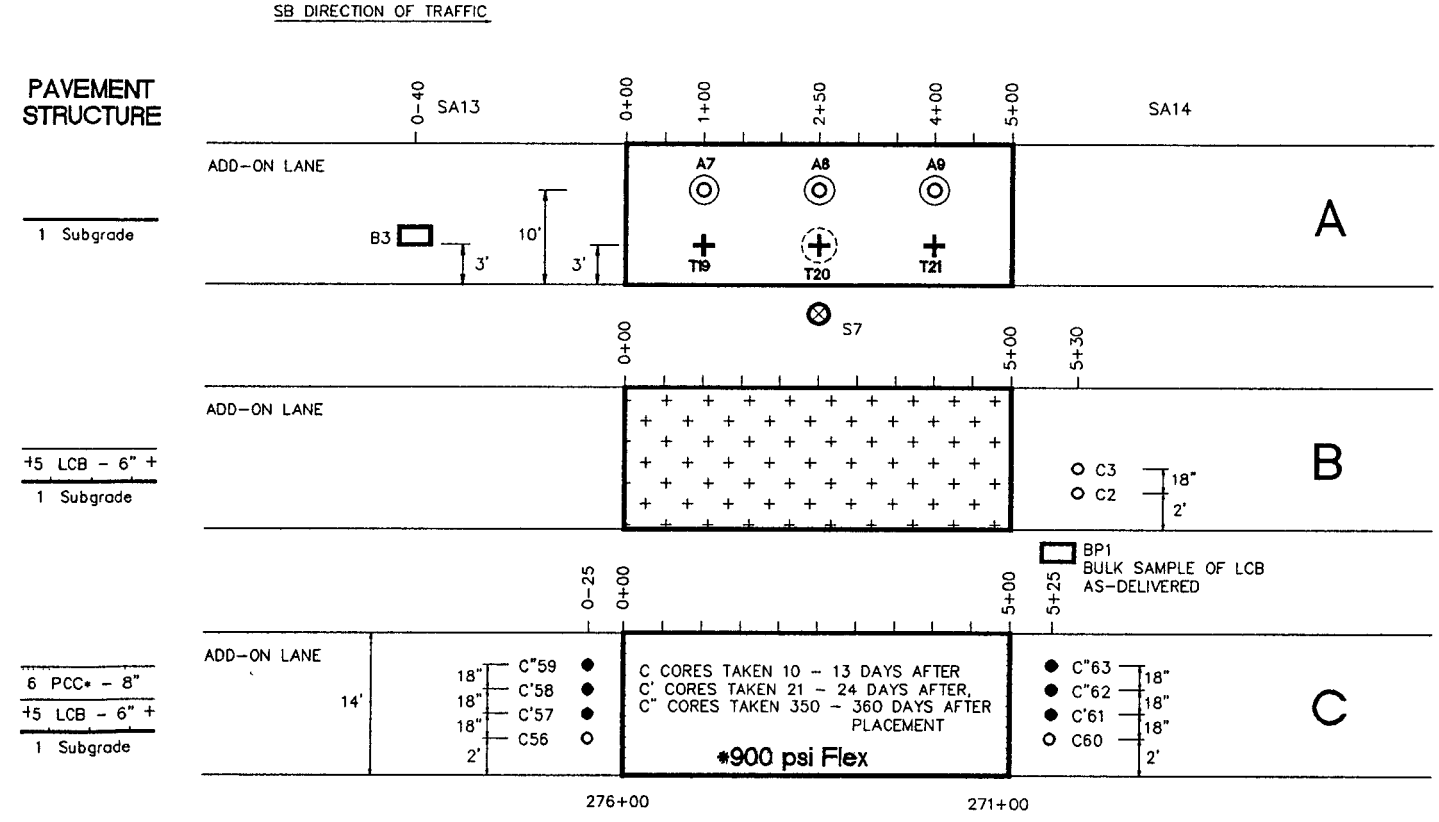
NORTH CAROLINA DOT SPS-2
US 52 SBL LEXINGTON BYPASS

PLOTDATE: JULY 5/93

FHWA SPS-2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

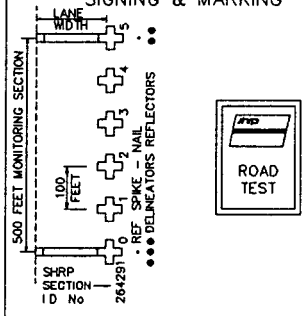
FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



SAMPLING AND TESTING PLAN FOR SECTION 370206

TYPICAL SITE SIGNING & MARKING



A + NUCLEAR DENSITY/MOISTURE TESTING (T19–T21)

◎ SHELBY TUBE/SPLIT SPOON SAMPLES TO 4" DEPTH (A7–A9)

⊗ SHOULDER PROBE (S7)

▭ BULK SAMPLE OF SUBGRADE 2'x2'x12" DEPTH (B3)

B ○ 4" O D CORES LCB TAKEN 10–13 DAYS AFTER PLACEMENT(C2,C3)

▭ BULK SAMPLE OF AS–DELIVERED LCB TEST SPECIMEN MOLDED (BP1)

C ○ 4" O D CORE OF PCC* SURFACING ONLY (C56,C60)

● 4" O D CORES OF PCC* AND LCB (C'57,C 58,C'61,C"59,C"62,C"63)

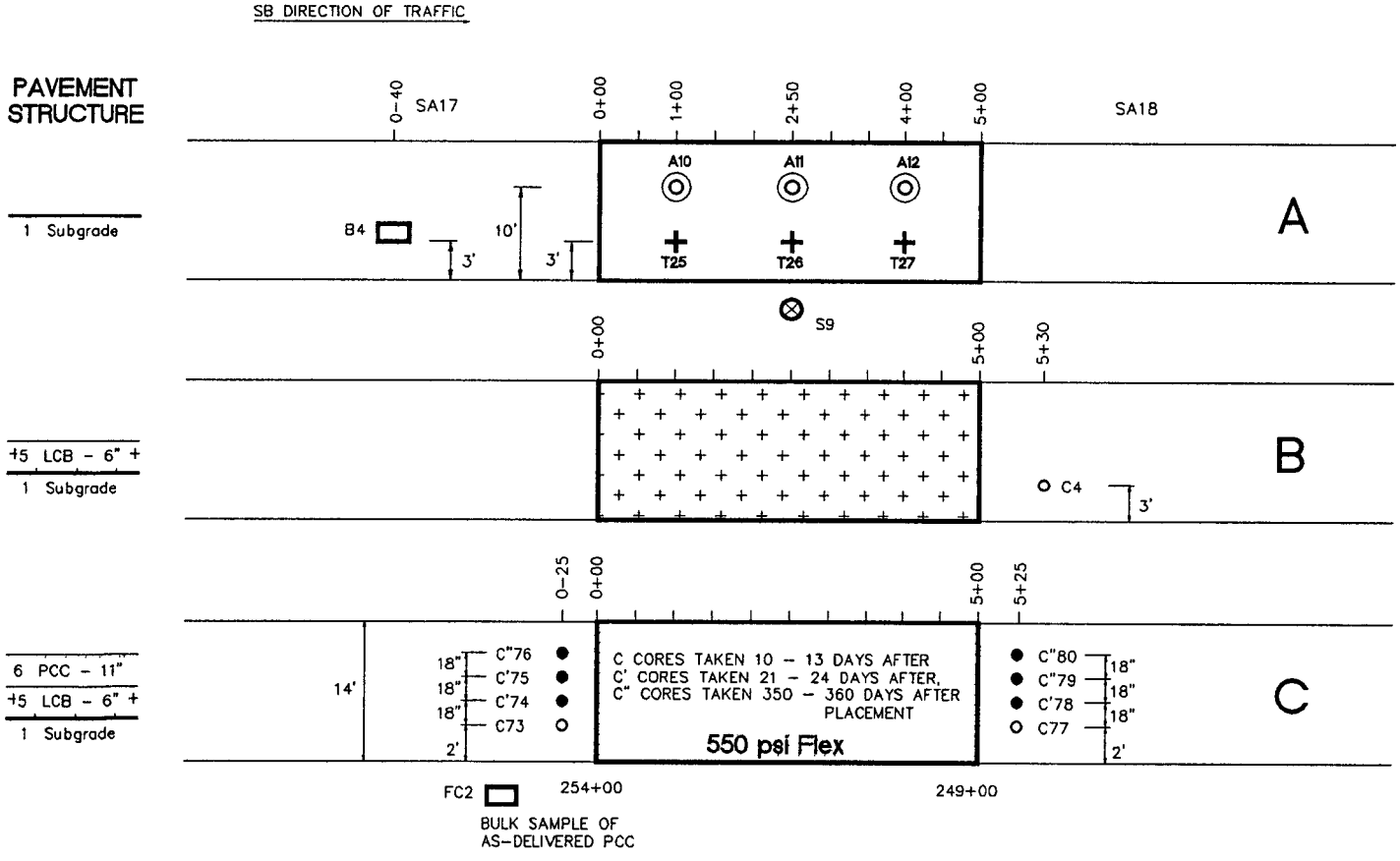
NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

PLOTDATE JULY 5/93

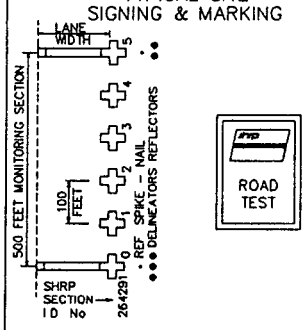
FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

FHWA-LTPP SPS-2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



TYPICAL SITE SIGNING & MARKING



A ✚ NUCLEAR DENSITY/MOISTURE TESTING (T25-T27)

◎ SHELBY TUBE/SPLIT SPOON SAMPLES TO 4" DEPTH (A10-A12)

⊗ SHOULDER PROBE (S9)

▭ BULK SAMPLING OF SUBGRADE SOIL 2'x2'x12" DEPTH (B4)

B ○ 4" O D CORE IN-PLACE LCB TAKEN 10-13 DAYS AFTER PLACEMENT (C4)

C ○ 4" O D CORE OF PCC SURFACING ONLY (C73,C77)

● 4" O D CORE OF PCC WITH ATTACHED LCB (C'74 C'75 C'78,C"76,C"79,C"80)

▭ FC BULK SAMPLE OF AS-DELIVERED PCC (FC2) MOLD TEST SPECIMEN

SAMPLING AND TESTING PLAN FOR SECTION 370207

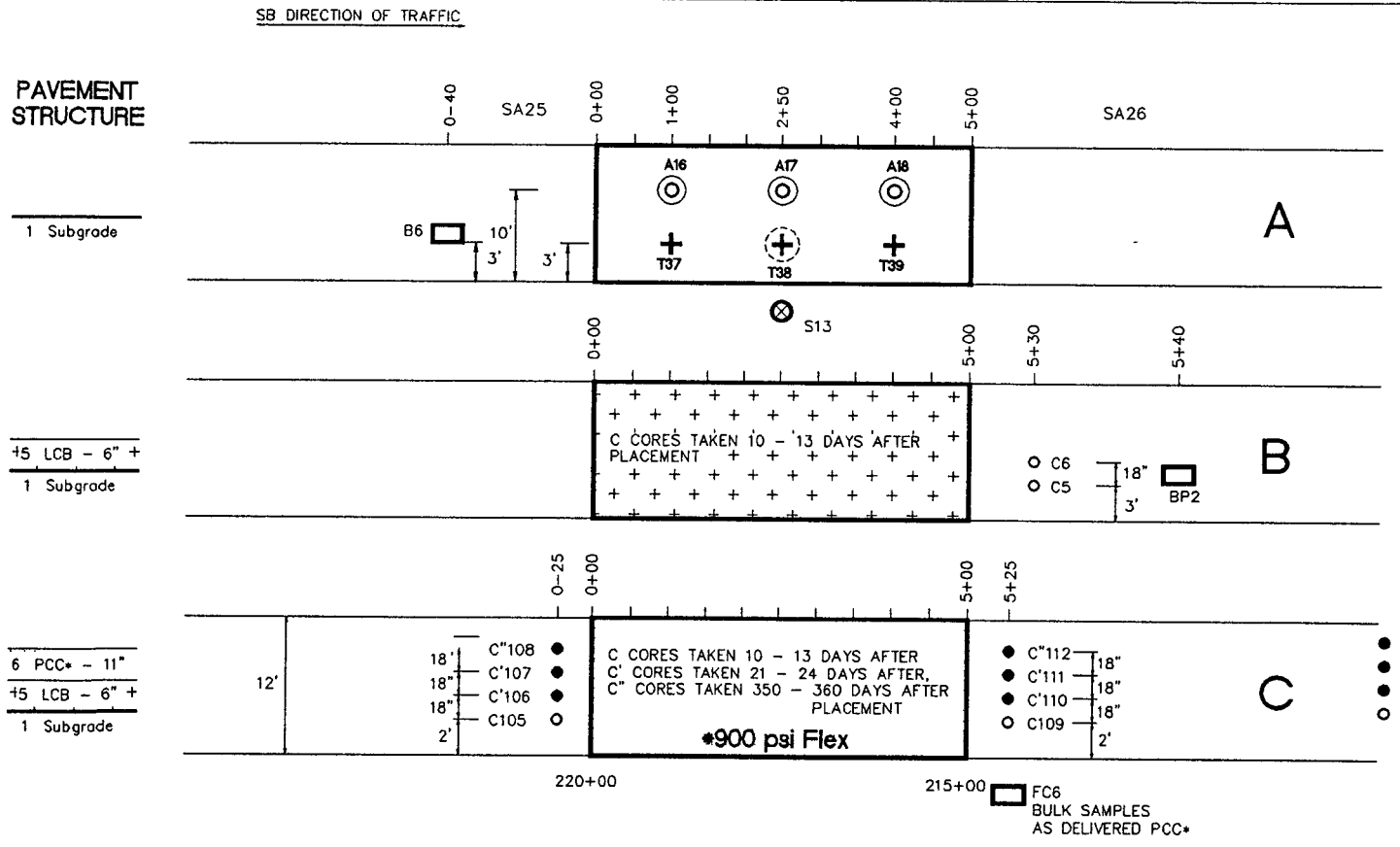
NORTH CAROLINA DOT SPS-2
US 52 SBL LEXINGTON BYPASS

PLOTDATE: JULY 5/93

FHWA SPS-2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

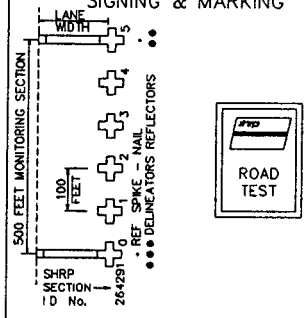
FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



SAMPLING AND TESTING PLAN FOR SECTION 370208

TYPICAL SITE SIGNING & MARKING



A
- NUCLEAR DENSITY/MOISTURE TESTING (T37–T39)
- PLATE LOAD TESTING OR FWD (T38)
- SHELBY TUBE/SPLIT SPOON SAMPLES TO 4" DEPTH (A16–A18)
- SHOULDER PROBE (S13)

B
- 4" O D CORES IN-PLACE LCB TAKEN 10–13 DAYS AFTER PLACEMENT AND HOLES PATCHED PRIOR TO PLACEMENT OF PCC (C5,C6)
- BULK SAMPLE OF AS-DELIVERED LCB TEST SPECIMEN MOLDED (BP2)

C
- 4" O D CORE OF PCC* SURFACING ONLY (C105,C109)
- 4" O D CORES OF PCC* AND LCB (C'106,C'107,C'110,C'111,C"108,C"112)
- BULK SAMPLE OF AS-DELIVERED PCC* TEST SPECIMEN MOLDED (FC6)

NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

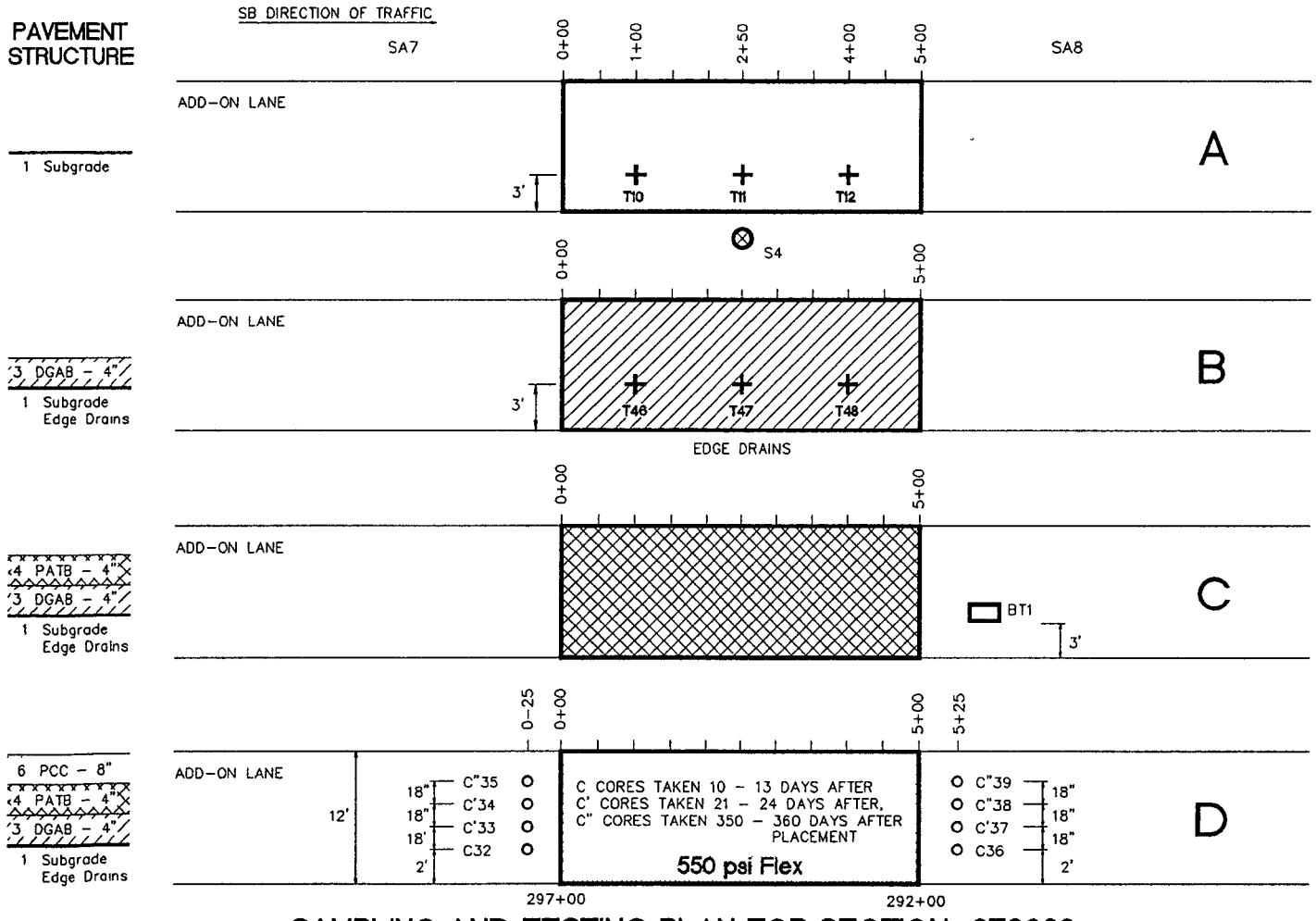
PLOTDATE: JULY 3/93

FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

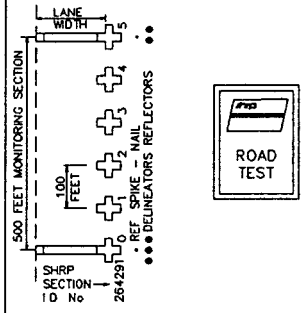
shrp

PMS — PAVEMENT MANAGEMENT SYSTEMS LIMITED



SAMPLING AND TESTING PLAN FOR SECTION 370209

TYPICAL SITE SIGNING & MARKING



A ✚ NUCLEAR DENSITY/MOISTURE TESTING (T10–T12)

⊗ SHOULDER PROBE (S4)

B ✚ NUCLEAR DENSITY/MOISTURE TESTING (T46–T48)

C ▭ BULK SAMPLE OF PATB AT PLANT (BT1)

D ○ 4" O.D. CORES OF PCC SURFACE ONLY (C32,C36,C'33 C 34,C'37,C"35,C"38 C"39)

NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

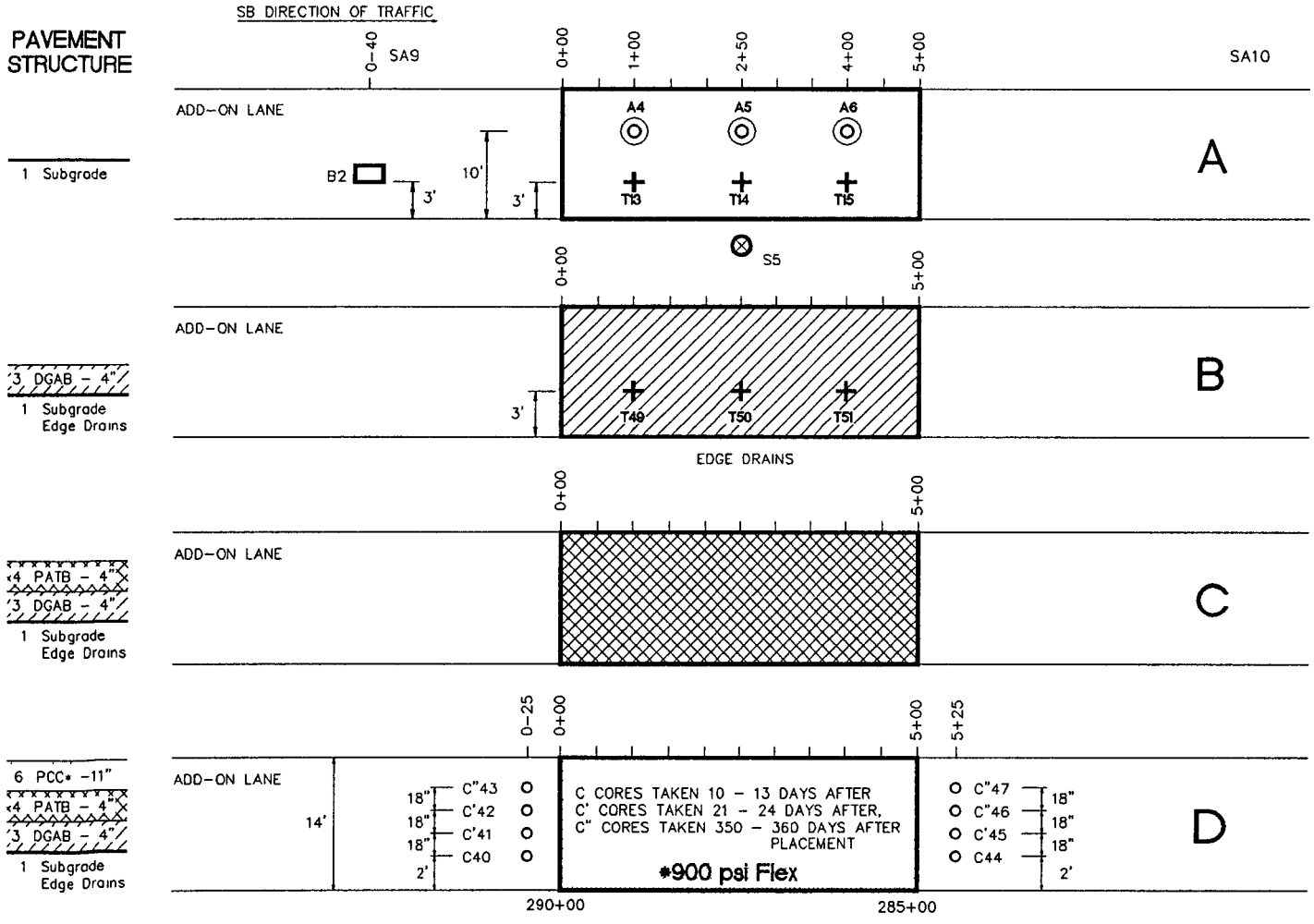
PLOTDATE: JULY 5/93

FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

FHWA-LTPP SPS-2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

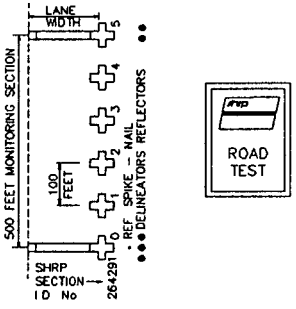
shrp

PMS — PAVEMENT MANAGEMENT SYSTEMS LIMITED



SAMPLING AND TESTING PLAN FOR SECTION 370210

TYPICAL SITE SIGNING & MARKING



A ✚ NUCLEAR DENSITY/MOISTURE TESTING (T13-T15)

◎ SHELBY TUBE/SPLIT SPOON SAMPLING (A4-A6)

⊗ SHOULDER PROBE (S5)

▭ BULK SAMPLE OF SUBGRADE 2'x2'x12" DEPTH (B2)

B ✚ NUCLEAR DENSITY/MOISTURE TESTING (T49-T51)

D ○ 4" O.D. CORES OF PCC SURFACING ONLY (C40,C44,C'41,C'42,C45,C"43,C"46,C"47)

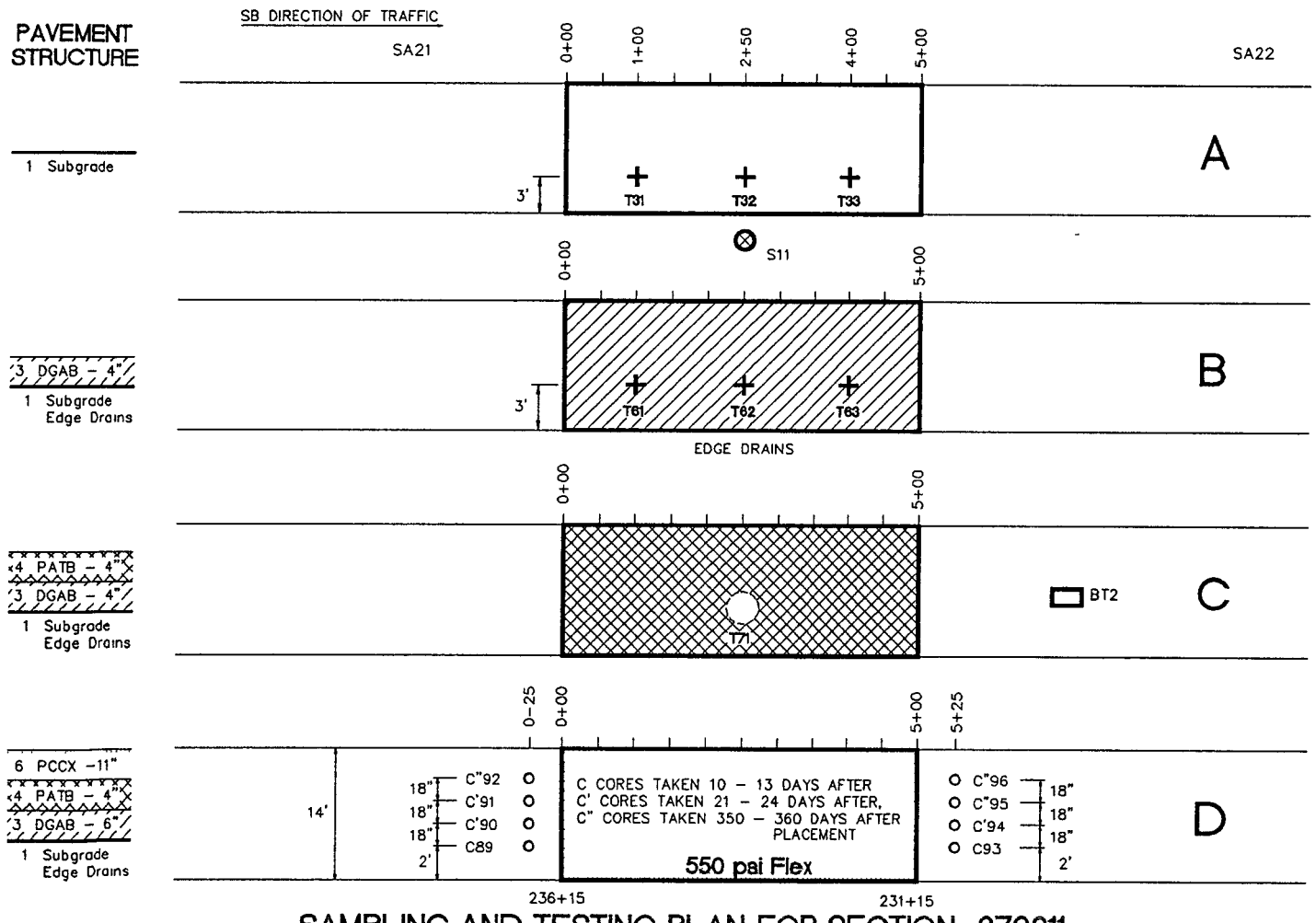
NORTH CAROLINA DOT SPS-2
US 52 SBL LEXINGTON BYPASS

PLOTDATE: JULY 3/93

FHWA SPS-2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

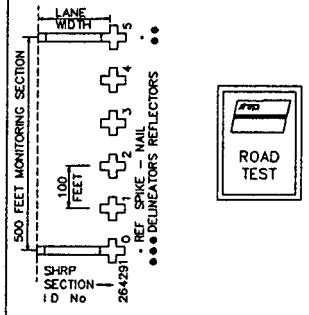
FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



SAMPLING AND TESTING PLAN FOR SECTION 370211

TYPICAL SITE SIGNING & MARKING



A ✚ NUCLEAR DENSITY/MOISTURE TESTING (T31–T33)

⊗ SHOULDER PROBE (S11)

B ✚ NUCLEAR DENSITY/MOISTURE TESTING (T61–T63)

◯ PLATE LOAD TESTING (T71)

D ○ 4" O D CORES OF PCC ONLY (C89,C93 C'90 C'91,C'94,C"92,C"95,C"96)

▭ BULK SAMPLE AT PLANT (BT2)

NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

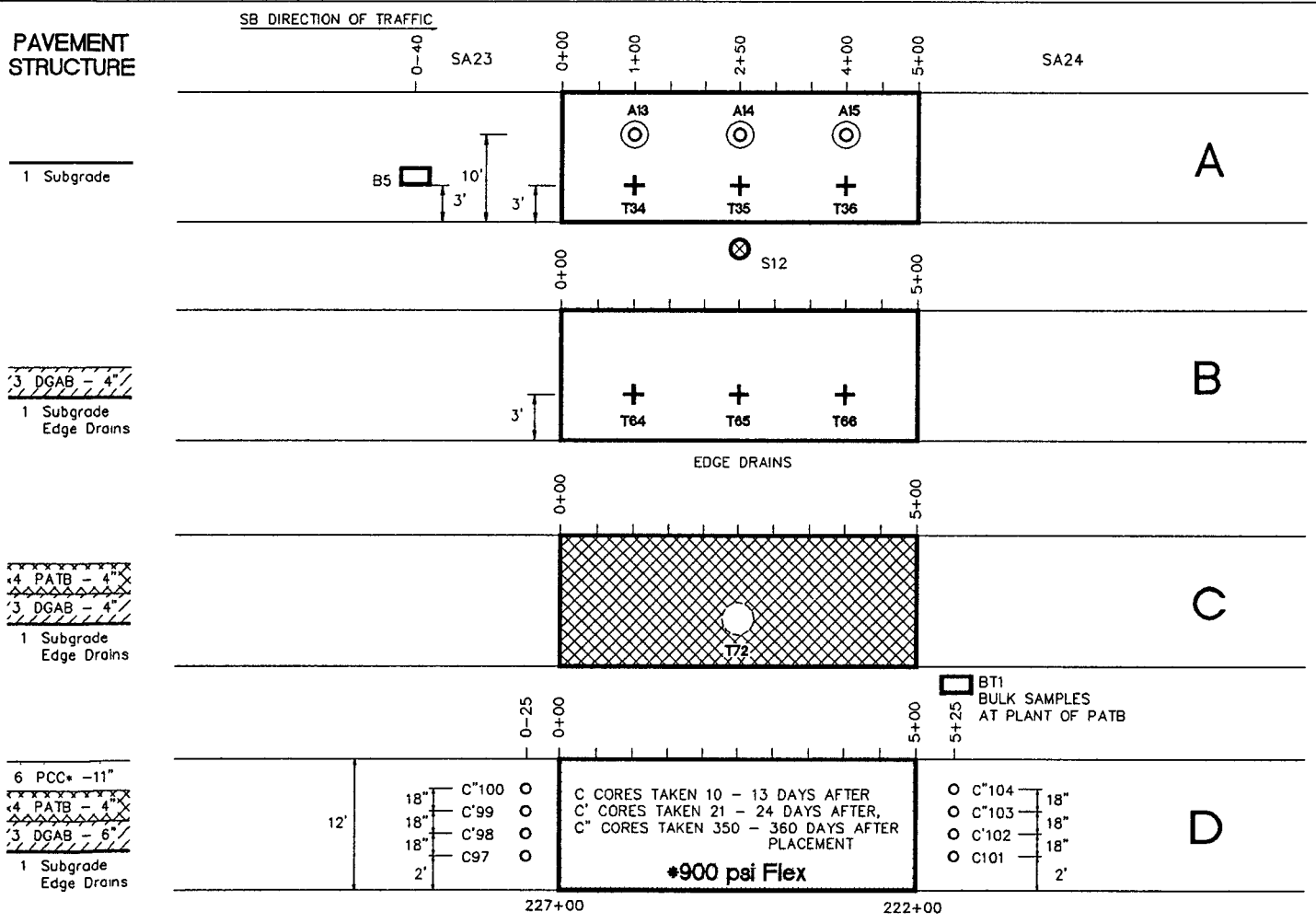
PLOTDATE JULY 5/93

FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

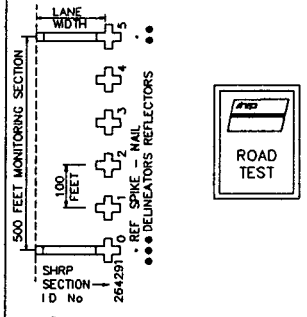
shrp

PMS — PAVEMENT MANAGEMENT SYSTEMS LIMITED



SAMPLING AND TESTING PLAN FOR SECTION 370212

TYPICAL SITE SIGNING & MARKING



A
- + NUCLEAR DENSITY/MOISTURE TESTING (T34–T36)
- ◎ SHELBY TUBE/SPLIT SPOON SAMPLING (A13–A15)
- ⊗ SHOULDER PROBE (S12)
- ▭ BULK SAMPLE OF SUBGRADE (B5)

B
- + NUCLEAR DENSITY/MOISTURE TESTING (T64–T66)

C
- ◌ PLATE LOAD TESTING (T72)
- ▭ BULK SAMPLE AT PLANT PATB (BT1)

D
- ○ 4" O D CORES OF PCC ONLY (C97,C101,C'98,C'99,C'102,C"103,C"100,C"104)

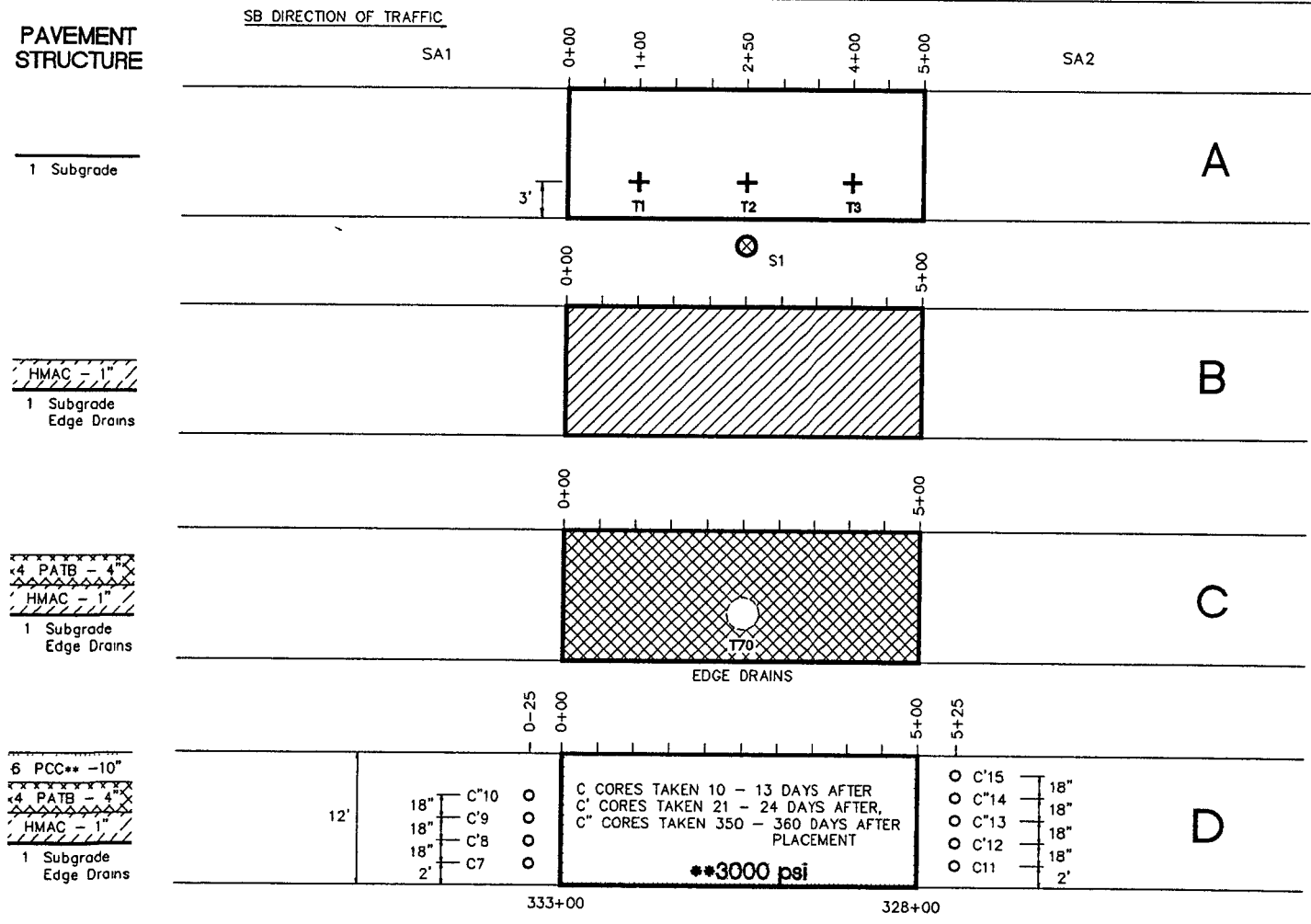
NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

PLOTDATE: JULY 5/93

FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

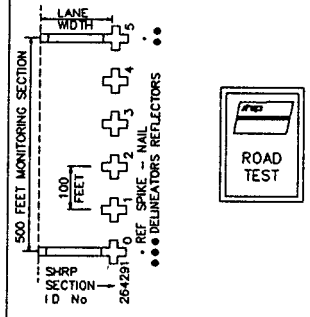
FHWA–LTPP SPS–2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



SAMPLING AND TESTING PLAN FOR SECTION 370259

TYPICAL SITE SIGNING & MARKING



A ✚ NUCLEAR DENSITY/MOISTURE TESTING (T1–T3)

⊗ SHOULDER PROBE (S1)

C ◯ PLATE LOAD TESTING (T70)

D ○ 4" O D CORES OF PCC' ONLY (C7,C11,C'8,C'9,C'12,C'15,C"10,C"13,C"14)

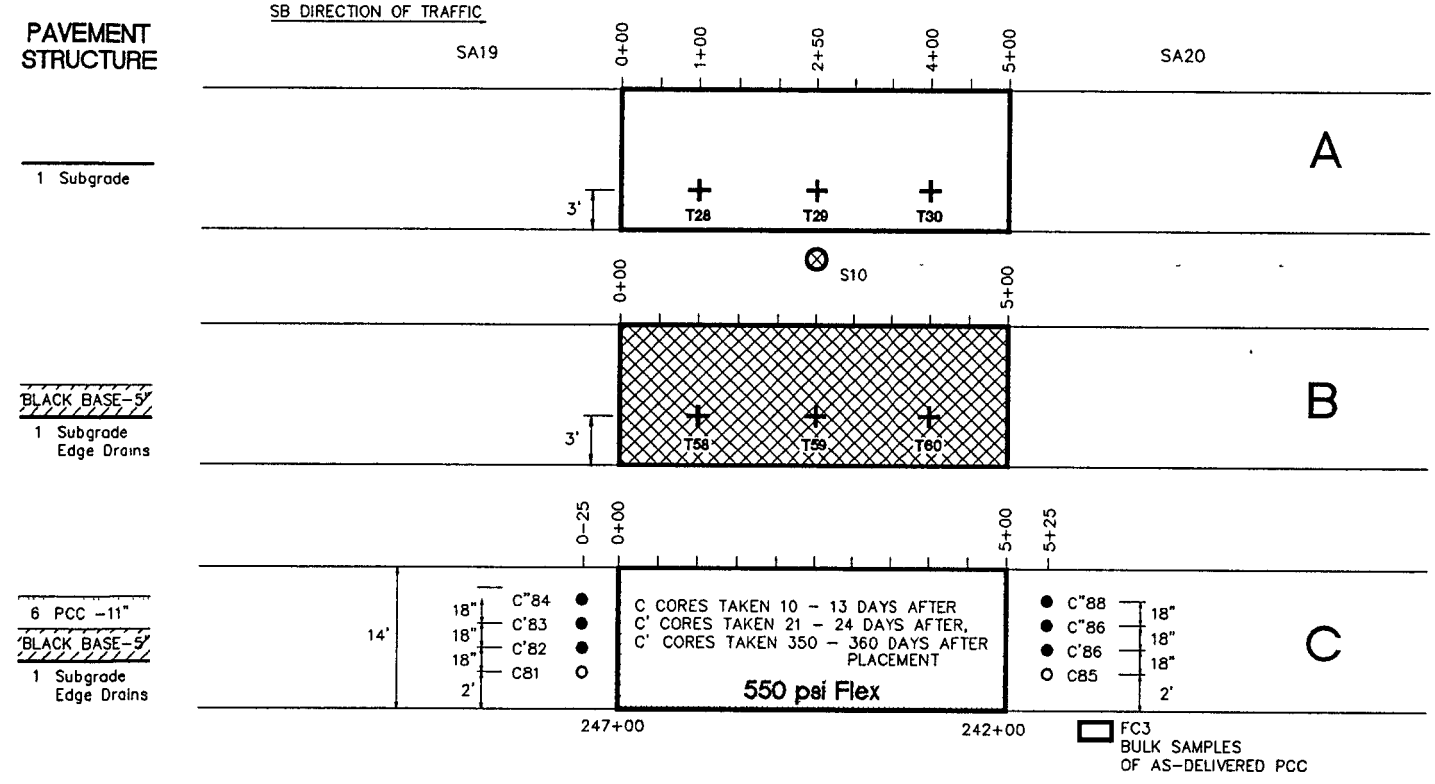
NORTH CAROLINA DOT SPS–2
US 52 SBL LEXINGTON BYPASS

PLOTDATE: JULY 5/93

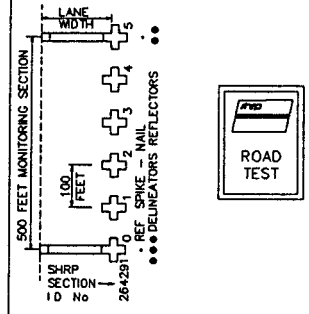
FHWA SPS–2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

FHWA-LTPP SPS-2 NORTH CAROLINA SAMPLING PLAN
STRUCTURAL FACTORS FOR RIGID PAVEMENTS

PAVEMENT MANAGEMENT SYSTEMS LIMITED



TYPICAL SITE SIGNING & MARKING



A + NUCLEAR DENSITY/MOISTURE TESTING (T28-T30)

⊗ SHOULDER PROBE (S10)

B + NUCLEAR DENSITY OF BLACK BASE LAYER (T58-T60)

C ○ 4" O D CORES OF PCC SURFACING ONLY (C81,C85)

○ 4" O D CORES OF PCC AND BOUND LAYERS(C'82,C'83,C'86,C"84,C"87,C"88)

▭ BULK SAMPLE OF AS-DELIVERED PCC (FC3) TEST SPECIMEN MOLDED

SAMPLING AND TESTING PLAN FOR SECTION 370260

NORTH CAROLINA DOT SPS-2
US 52 SBL LEXINGTON BYPASS

PLOTDATE: JULY 5/93

FHWA SPS-2 TEST SECTIONS ONLY
DIMENSIONAL DETAILS ONLY
DRAWING NOT TO SCALE

SCHEDULE FOR POST-CONSTRUCTION CORING OF PCC & LCB
4" O.D. CORES

July 01, 1993

DAYS AFTER PLACEMENT	CORE # 0+00 END	SECTION NO.	CORE # 5+00 END	LAYER NO.	LAYER THICK INS.	MATERIAL DESCRIP-TION	LAB. TEST PROTOCOL	APPROX. CONSTR. STA.	OFFSET FT.
10-13 days		370205	C1	2	6	LCB	P61	305+70	2'
		370206	C2	2	6	LCB	P61	270+70	2'
			C3	2	6	LCB	P61	270+70	3.5'
		370207	C4	2	6	LCB	P61	248+70	2'
		370208	C5	2	6	LCB	P61	214+70	2'
			C6	2	6	LCB	P61	214+70	3.5'
10-13 days	C7	370259		4	10	PCC 3000	P65, P61	333+25	2'
			C11	4	10	PCC 3000	P62	327+75	2'
	C16	370205		3	8	PCC 550	P65, P61	311+25	2'
				2	6	LCB	N/A		
			C20	3	8	PCC 550	P62	305+75	2'
				2	6	LCB	P61		
	C24	370201		3	8	PCC 550	P65, P61	304+25	2'
			C28	3	8	PCC 550	P62	298+75	2'
	C32	370209		4	8	PCC 550	P65, P61	297+25	2'
			C36	4	8	PCC 550	P62	291+75	2'
	C40	370210		4	8	PCC 900	P65, P61	290+25	2'
			C44	4	8	PCC 900	P62	284+75	2'
	C48	370202		3	8	PCC 900	P65, P61	283+25	2'
			C52	3	8	PCC 900	P62	277+75	2'
	C56	370206		3	8	PCC 900	P65, P61	276+25	2
				2	6	LCB	N/A		
			C60	3	8	PCC 900	P62	270+75	2'
				2	6	LCB	P61		
	C64	370203		3	11	PCC 550	P65, P61	261+25	2'
			C68	3	11	PCC 550	P62	255+75	2'
	C73	370207		3	11	PCC 550	P65, P61	254+25	2'
				2	6	LCB	N/A		
			C77	3	11	PCC 550	P62	248+75	2'
				2	6	LCB	P61		

NC DOT SPS-2, LEXINGTON, NC
SCHEDULE FOR POST-CONSTRUCTION CORING OF PCC & LCB
4" O.D. CORES

July 01, 1993 Sheet 2/5

DAYS AFTER PLACEMENT	CORE # 0+00 END	SECTION NO.	CORE # 5+00 END	LAYER NO.	LAYER THICK INS.	MATERIAL DESCRIP-TION	LAB TEST PROTOCOL	APPROX. CONSTR. STA.	OFFSET FT.
10-13 days	C81	370260		3	11	PCC 550	P65, P61	247+25	2'
				2	5	BL. BASE			
			C85	3	11	PCC 550	P62	241+75	2'
				2	5	BL. BASE			
	C89	370211		4	11	PCC 550	P65, P61	236+40	2'
			C93	4	11	PCC 550	P62	230+90	2'
	C97	370212		4	11	PCC 900	P65, P61	227+25	2'
			C101	4	11	PCC 900	P62	221+75	2'
	C105	370208		3	11	PCC 900	P65, P61	220+25	2'
				2	6	LCB	N/A		
			C109	3	11	PCC 900	P62	214+75	2'
				2	6	LCB	P61		
	C113	370204		3	11	PCC 900	P65, P61	142+25	2'
			C117	3	11	PCC 900	P62	136+75	2'
21-24 days	C'8	370259		4	10	PCC 3000	P65, P61	333+25	3.5'
	C'9			4	10	PCC 3000	P64, P68	333+25	5.0'
			C'12	4	10	PCC 3000	P62	327+75	3 5'
			C'15	4	10	PCC 3000	P63*	327+75	8.0'
	C'17	370205		3	8	PCC 550	P65, P61	311+25	3.5'
				2	6	LCB	N/A		
	C'18			3	8	PCC 550	P64	311+25	5.0'
				2	6	LCB	N/A		
			C'21	3	8	PCC 550	P62	305+75	3.5'
				2	6	LCB	N/A		
	C'25	370201		3	8	PCC 550	P65, P61	304+25	3.5'
	C'26			3	8	PCC 550	P64	304+25	5.0'
			C'29	3	8	PCC 550	P62	298+75	3.5'
	C'33	370209		4	8	PCC 550	P65, P61	297+25	3.5'
	C'34			4	8	PCC 550	P64	297+25	5.0'
			C'37	4	8	PCC 550	P62	291+75	3.5'
	C'41	370210		4	8	PCC 900	P65, P61	290+25	3.5'
	C'42			4	8	PCC 900	P64	290+25	5.0'
			C'45	4	8	PCC 900	P62	284+75	3.5'

* PACKAGE AND SHIP CORES TO DESIGNATED FHWA LABORATORY (C'15, C'72, C'121)

NC DOT SPS-2, LEXINGTON, NC
SCHEDULE FOR POST-CONSTRUCTION CORING OF PCC & LCB
4" O.D. CORES

July 01, 1993 Sheet 3/5

DAYS AFTER PLACEMENT	CORE # 0+00 END	SECTION NO.	CORE # 5+00 END	LAYER NO.	LAYER THICK INS.	MATERIAL DESCRIP-TION	LAB. TEST PROTOCOL	APPROX. CONSTR. STA.	OFFSET FT.
21-24 days	C'49	370202		3	8"	PCC 900	P65, P61	283+25	3.5'
	C'50			3	8"	PCC 900	P64	283+25	5.0'
			C'53	3	8"	PCC 900	P62	277+75	3.5'
	C'57	370206		3	8"	PCC 900	P65, P61	276+25	3.5'
				2	6"	LCB	N/A		
	C'58			3	8"	PCC 900	P64	276+25	5.0'
				2	6"	LCB	N/A		
			C'61	3	8"	PCC 900	P62	270+75	3.5'
				2	6"	LCB	N/A		
	C'65	370203		3	11"	PCC 550	P65, P61	261+25	3.5'
	C'66			3	11"	PCC 550	P64, P68	261+25	5.0'
			C'69	3	11"	PCC 550	P62	255+75	3.5'
			C'72	3	11"	PCC 550	P63*	255+75	8.0'
	C'74	370207		3	11"	PCC 550	P65, P61	254+25	3.5'
				2	6"	LCB	N/A		
	C'75			3	11"	PCC 550	P64	254+25	5.0'
				2	6"	LCB	N/A		
			C'78	3	11"	PCC 550	P62	248+75	3.5'
				2	6"	LCB	N/A		
	C'82	370260		3	11"	PCC 550	P65, P61	247+25	3.5'
				2	5"	BL. BASE	P07		
	C'83			3	11"	PCC 550	P64	247+25	5.0'
				2	5"	BL. BASE	P07		
			C'86	3	11"	PCC 550	P62	241+75	3.5'
				2	5"	BL. BASE	P07		
	C'90	370211		4	11"	PCC 550	P65, P61	236+40	3.5'
	C'91			4	11"	PCC 550	P64	236+40	5.0'
			C'94	4	11"	PCC 550	P62	230+90	3.5'
	C'98	370212		4	11"	PCC 900	P65, P61	227+25	3.5'
	C'99			4	11"	PCC 900	P64	227+25	5.0'
			C'102	4	11"	PCC 900	P62	221+75	3.5'

NC DOT SPS-2, LEXINGTON, NC
SCHEDULE FOR POST-CONSTRUCTION CORING OF PCC & LCB
4" O.D. CORES

July 01, 1993 Sheet 4/5

DAYS AFTER PLACEMENT	CORE # 0+00 END	SECTION NO.	CORE # 5+00 END	LAYER NO.	LAYER THICK INS.	MATERIAL DESCRIP-TION	LAB. TEST PROTOCOL	APPROX. CONSTR. STA.	OFFSET FT.
21-24 days	C'106	370208		3	11"	PCC 900	P65, P61	220+25	3.5'
				2	6"	LCB	N/A		
	C'107			3	11"	PCC 900	P64	220+25	5.0'
				2	6"	LCB	N/A		
			C'110	3	11"	PCC 900	P62	214+75	3.5'
				2	6"	LCB	N/A		
	C'114	370204		3	11"	PCC 900	P65, P61	142+25	3.5'
	C'115			3	11"	PCC 900	P64, P68	142+25	5.0'
			C'118	3	11"	PCC 900	P62	136+75	3.5'
			C'121	3	11"	PCC 900	P63*	136+75	8.0'
350-360 days	C"10	370259		4	10"	PCC 3000	P62	333+25	6.5'
			C"13	4	10"	PCC 3000	P65, P61	327+75	5.0'
			C"14	4	10"	PCC 3000	P64	327+75	6.5'
	C"19	370205		3	8"	PCC 550	P62	311+25	6.5'
				2	6"	LCB	P61		
			C"22	3	8"	PCC 550	P65, P61	305+75	5.0'
				2	6"	LCB	N/A		
			C"23	3	8"	PCC 550	P64	305+75	6.5'
				2	6"	LCB	N/A		
	C"27	370201		3	8"	PCC 550	P62	304+25	6.5'
			C"30	3	8"	PCC 500	P65, P61	298+75	5.0'
			C"31	3	8'	PCC 550	P64	298+75	6.5'
	C"35	370209		4	8"	PCC 550	P62	297+25	6.5'
			C"38	4	8"	PCC 550	P65, P61	291+75	5.0'
			C"39	4	8"	PCC 550	P64	291+75	6.5'
	C"43	370210		4	8"	PCC 900	P62	290+25	6.5'
			C"46	4	8"	PCC 900	P65, P61	284+75	5.0'
			C"47	4	8"	PCC 900	P64	284+75	6.5'
	C"51	370202		3	8"	PCC 900	P62	283+25	6.5'
			C"54	3	8"	PCC 900	P65, P61	277+75	5.0'
			C"55	3	8"	PCC 900	P64	277+75	6.5'

NC DOT SPS-2, LEXINGTON, NC
SCHEDULE FOR POST-CONSTRUCTION CORING OF PCC & LCB
4" O.D. CORES

July 01, 1993 Sheet 5/5

DAYS AFTER PLACEMENT	CORE # 0+00 END	SECTION NO.	CORE # 5+00 END	LAYER NO.	LAYER THICK INS.	MATERIAL DESCRIP-TION	LAB. TEST PROTOCOL	APPROX. CONSTR. STA.	OFFSET FT.
350-360 days	C"59	370206		3	8"	PCC 900	P62	276+25	6.5'
				2	6"	LCB	P61		
			C"62	3	8"	[CC 900	P65, P61	270+75	5.0'
				2	6"	LCB	N/A		
			C"63	3	8"	PCC 900	P64	270+75	6.5'
				2	6"	LCB	N/A		
	C"67	370203		3	11"	PCC 550	P62	261+25	6.5'
			C"70	3	11"	PCC 550	P65, P61	255+75	5.0'
			C"71	3	11"	PCC 550	P64	255+75	6.5'
	C"76	370207		3	11"	PCC 550	P62	254+25	6.5'
				2	6"	LCB	P61		
			C"79	3	11'	PCC 550	P65, P61	248+75	5.0'
				2	6"	LCB	N/A		
			C"80	3	11"	PCC 550	P64	248+75	6.5'
				2	6"	LCB	N/A		
	C"84	370260		3	11"	PCC 550	P62	247+25	6.5'
				2	5"	BL. BASE	P07		
			C"87	3	11"	PCC 550	P65, P61	241+75	5.0'
				2	5"	BL. BASE	P07		
			C"88	3	11"	PCC 550	P64	241+75	6.5'
				2	5"	BL. BASE	P07		
	C"92	370211		4	11"	PCC 500	P62	236+40	6.5'
			C"95	4	11"	PCC 550	P65, P61	230+90	5.0'
			C"96	4	11"	PCC 550	P64	230+90	6.5'
	C"100	370212		4	11'	PCC 900	P62	227+25	6.5'
			C"103	4	11"	PCC 900	P65, P61	221+75	5.0'
			C"104	4	11"	PCC 900	P64	221+75	6.5'
	C"108	370208		3	11"	PCC 900	P62	220+25	6.5'
				2	6"	LCB	P61		
			C"111	3	11"	PCC 900	P65, P61	214+75	5.0'
				2	6"	LCB	N/A		
			C"112	3	11"	PCC 900	P64	214+75	6.5'
				2	6"	LCB	N/A		
	C"116	370204		3	11"	PCC 900	P62	142+25	6.5'
			C"119	3	11"	PCC 900	P65, P61	136+75	5.0'
			C"120	3	11"	PCC 900	P64	136+75	6.5'