

SPS-9  
WISCONSIN(55) 55A9  
B9

**BRAUN**<sup>SM</sup>  
**INTERTEC**

**Braun Intertec Pavement, Inc.**  
1983 Sloan Place  
St Paul, Minnesota 55117-2004  
612-776-7522 Fax 776-7201

*Engineers and Scientists Serving  
the Built and Natural Environments*

May 13, 1992

Mr. Kevin McMullen, P.E.  
Wisconsin Dept. of Transportation  
Room 633 Hill Farm Street  
Madison, WI 53707



Dear Mr. McMullen:

Attached is the updated Materials and Sampling Plan for the SPS-9A and 9B projects to be located on I-43 near Waukesha. Note that the final locations of cores and test pits will be determined in the field, when crack or joint locations are known. Final locations will be very close to those shown on the plan. The information has also been faxed to Dick Rutzen. Please give us advanced notice of when the actual sampling will be done so we can have a SHRP representative on site.

Also attached are updated location maps showing each section for SPS-9A and 9B. Please discard all other maps showing section locations, as these are the final version. We have enclosed a preliminary schedule for Drilling and Sampling, FWD, Profile, and Distress Surveys. Please review this schedule and call me with comments. We need to send a copy to the Contractor and your field representatives soon so that they can accommodate all the testing needs.

Lastly, we have enclosed one copy each of the Maintenance Data Sheet and Inventory Data Sheet for the SHRP database. One of each form must be filled out for each SPS-9 project. Therefore, we will need three from you: SPS-9A and SPS-9B near Waukesha, and SPS-9 near Tomah. Please call me with questions.

Note that we need to forward the nomination forms to SHRP for approval of all three of Wisconsin's SPS-9 projects as soon as possible. Please fax the nomination forms to me at (612) 776-7201. Also call if you have any questions in filling out the nominations.

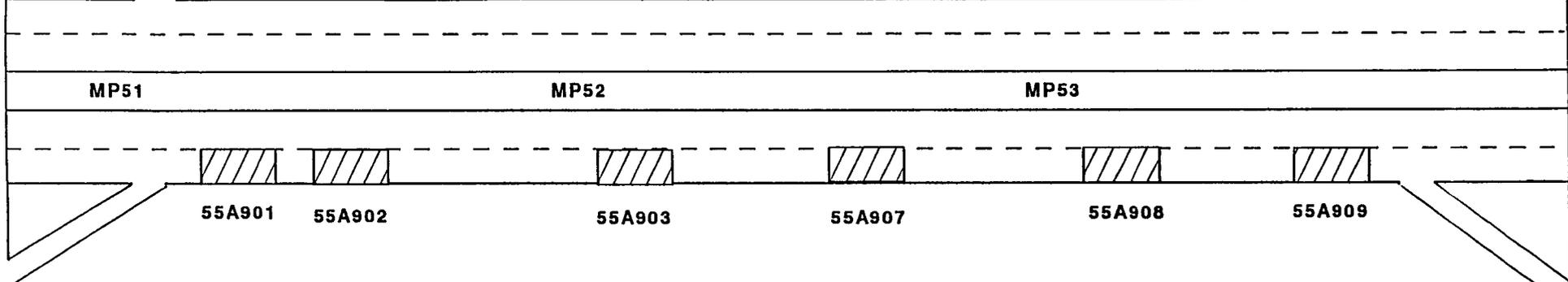
I am confident that with cooperation from everybody, we can successfully complete all three SPS-9 projects. Feel free to call and ask for assistance anytime.

Sincerely,



Ann Johnson, P.E.  
Senior Engineer

**SPS - 9A**  
**MILWAUKEE, WISCONSIN**  
**NORTHBOUND I-43**



<u>SECTION</u>	<u>TYPE OF AC</u>	<u>STATION</u>
55A901	CONTROL	481+00 - 486+00
55A902	SHRP MIX	492+15 - 497+15
55A903	SMA (F1)	525+00 - 530+00
55A907	SMA (F2)	553+00 - 558+00
55A908	SMA (P1)	588+87 - 593+87
55A909	EXTRA	611+29 - 616+29



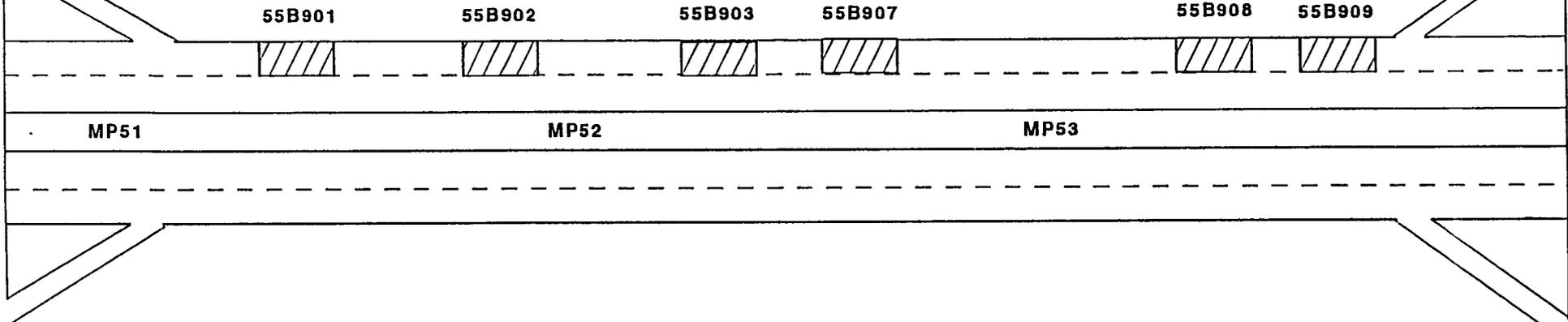
**NOTE: SPS-9A IS IN THE NB LANE**  
**SPS-9B IS IN THE SB LANE**

**TO MILWAUKEE**

HWY-164

COUNTY Y  
(RACINE AVE)

**SPS - 9B**  
**MILWAUKEE, WISCONSIN**  
**SOUTHBOUND I-43**



<u>SECTION</u>	<u>TYPE OF AC</u>	<u>STATION</u>
55B909	EXTRA	610+90 - 605+90
55B908	SMA (P2)	600+43 - 595+43
55B907	SMA (E1)	560+00 - 555+00
55B903	SMA (E2)	542+42 - 537+42
55B902	SHRP MIX	510+00 - 505+00
55B901	CONTROL	485+68 - 480+68



**NOTE: SPS-9A IS IN THE NB LANE**  
**SPS-9B IS IN THE SB LANE**

**TO MILWAUKEE** →

TENTATIVE SCHEDULE FOR MONITORING ACTIVITIES FOR SHRP  
WISCONSIN SPS-9A AND SPS-9B SITES NEAR MILWAUKEE, WISCONSIN

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
MAY	11	12	13	14	15	16	17
	18	19 D&S? See Note (1)	20 D&S?	21 D&S?	22 D&S?	23 D&S?	24
	25	26 HOLIDAY	27 D&S? FWD TESTING DISTRESS SUR See Note (2)	28 D&S? FWD TESTING DISTRESS SUR	29 D&S? FWD TESTING DISTRESS SUR	30 D&S? FWD TESTING DISTRESS SUR	31
JUNE	1 TENTATIVE LANE SHIFT PCC WORK ON PASSING LANE	2 PROFILE PASCO See Note (3)	3 PROFILE PASCO	4 PROFILE PASCO	5 PROFILE PASCO	6 PROFILE PASCO	7
	8	9 PROFILE PASCO	10 PROFILE PASCO	11 PROFILE PASCO	12 PROFILE PASCO	13 PROFILE PASCO	14

OVERLAY IS EXPECTED TO BEGIN JUNE 1, 1992

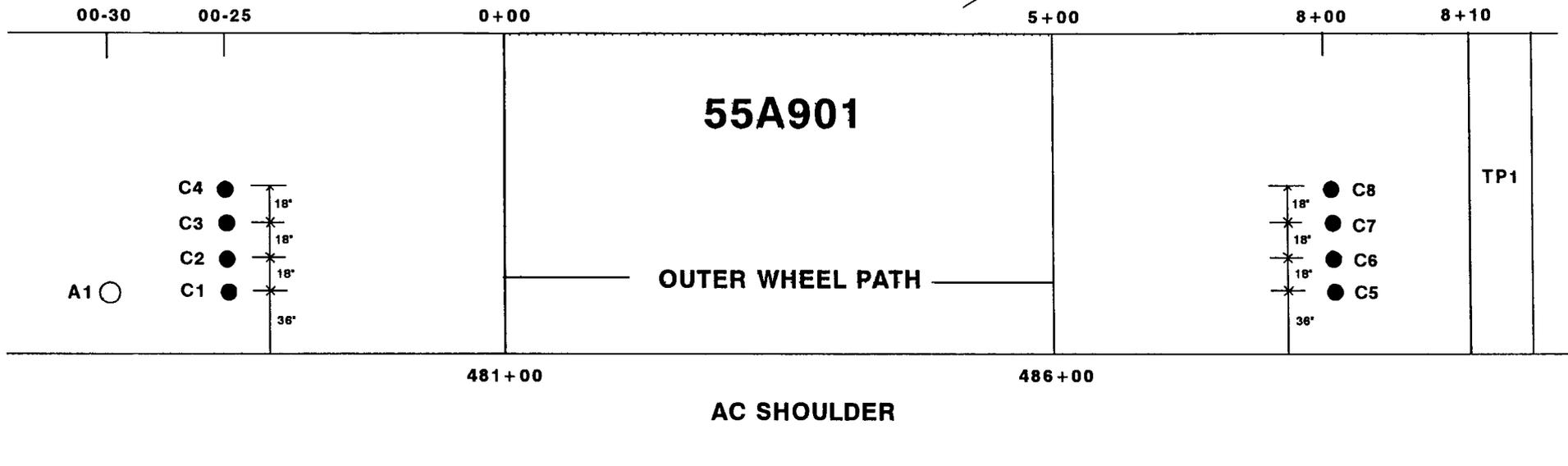
NOTES:

- (1) Drilling and Sampling (D&S) performed or contracted for by State.  
Traffic must be on left (passing) lane.
- (2) FWD Testing, Distress Survey both require traffic control.  
Traffic must be on left (passing) lane.
- (3) Profile and PASCO done with traffic on right lane. No traffic control required.

# PRE-CONSTRUCTION SAMPLING AND TESTING

## SPS-9A MILWAUKEE, WISCONSIN I-43 NORTHBOUND

DIRECTION OF TRAVEL 

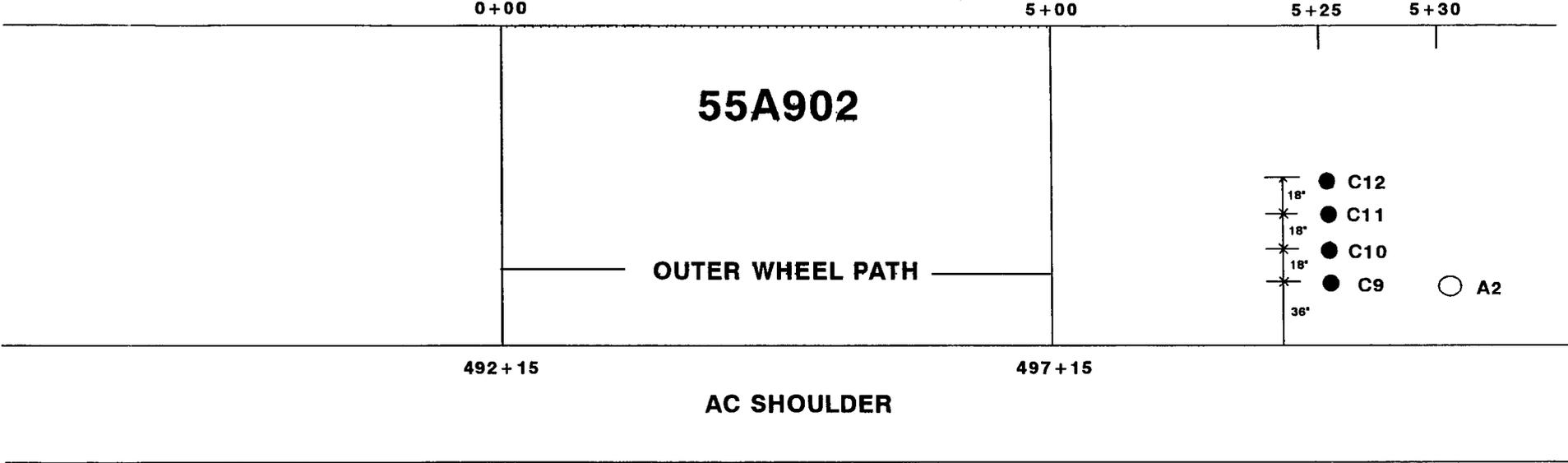


- 4" OD CORE OF SURFACE AND UNDERLAIN BOUND BASE.
- 6" OD CORE OF SURFACE AND UNDERLAIN BOUND LAYER  
THIN-WALLED TUBE AND/OR SPLITSPOON SAMPLING 4' BELOW TOP OF  
SUBGRADE.
- ⊕ SHOULDER PROBE 20' BELOW TOP OF SHOULDER
- ▭ TEST PIT TO OBTAIN NUCLEAR DENSITY AND BULK SAMPLES.

# PRE-CONSTRUCTION SAMPLING AND TESTING

## SPS-9A MILWAUKEE, WISCONSIN I-43 NORTHBOUND

DIRECTION OF TRAVEL



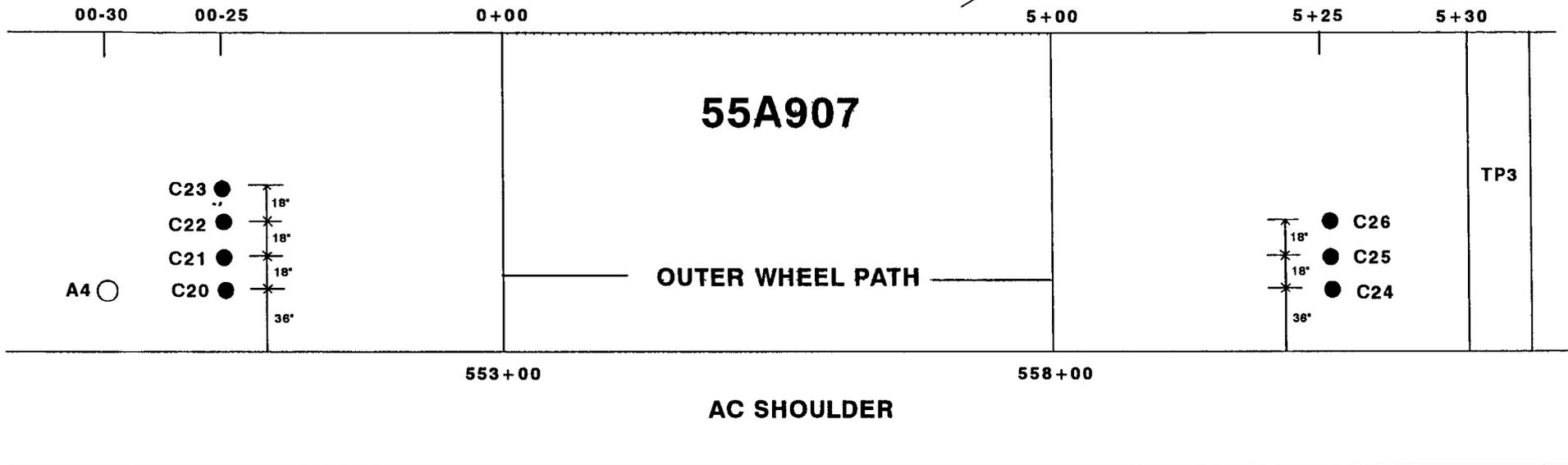
- 4" OD CORE OF SURFACE AND UNDERLAIN BOUND BASE.
  
- 6" OD CORE OF SURFACE AND UNDERLAIN BOUND LAYER THIN-WALLED TUBE AND/OR SPLITSPOON SAMPLING 4' BELOW TOP OF SUBGRADE.
  
- SHOULDER PROBE 20' BELOW TOP OF SHOULDER
  
- TEST PIT TO OBTAIN NUCLEAR DENSITY AND BULK SAMPLES.



# PRE-CONSTRUCTION SAMPLING AND TESTING

## SPS-9A MILWAUKEE, WISCONSIN I-43 NORTHBOUND

DIRECTION OF TRAVEL →



S4



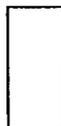
4" OD CORE OF SURFACE AND UNDERLAIN BOUND BASE.



6" OD CORE OF SURFACE AND UNDERLAIN BOUND LAYER  
THIN-WALLED TUBE AND/OR SPLITSPOON SAMPLING 4' BELOW TOP OF  
SUBGRADE.



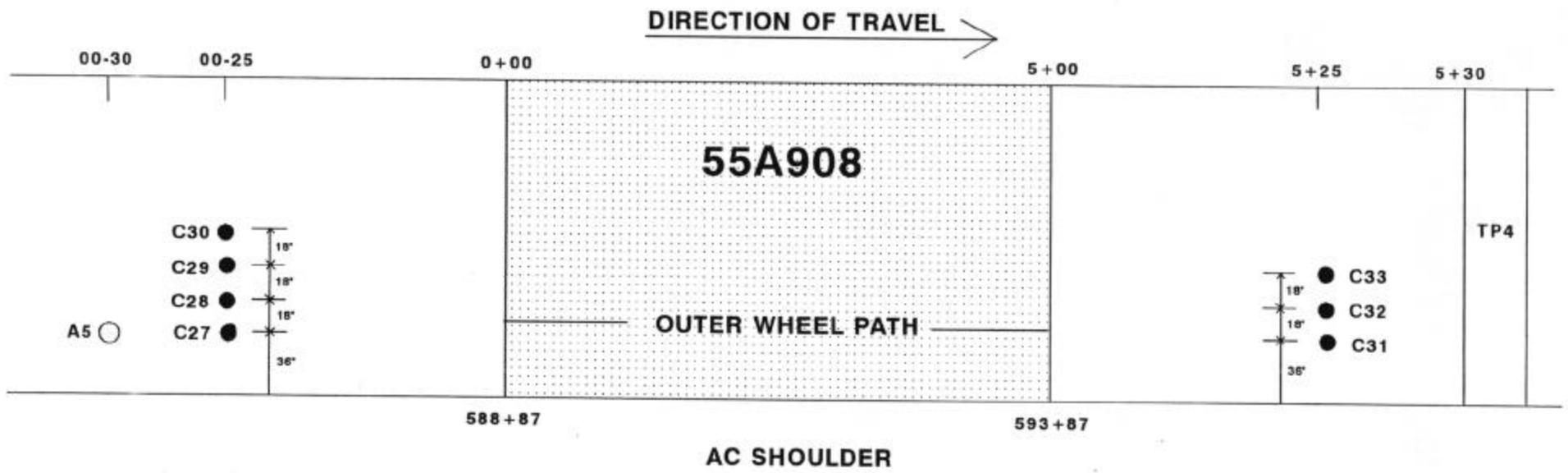
SHOULDER PROBE 20' BELOW TOP OF SHOULDER



TEST PIT TO OBTAIN NUCLEAR DENSITY AND BULK SAMPLES.

# PRE-CONSTRUCTION SAMPLING AND TESTING

SPS-9A  
MILWAUKEE, WISCONSIN  
I-43 NORTHBOUND



- 4" OD CORE OF SURFACE AND UNDERLAIN BOUND BASE.
- 6" OD CORE OF SURFACE AND UNDERLAIN BOUND LAYER THIN-WALLED TUBE AND/OR SPLITSPOON SAMPLING 4' BELOW TOP OF SUBGRADE.
- ⊕ SHOULDER PROBE 20' BELOW TOP OF SHOULDER
- ▭ TEST PIT TO OBTAIN NUCLEAR DENSITY AND BULK SAMPLES.



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*Engineers and Scientists Serving  
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DATE: June 5, 1992

MEMO TO: Bruce Pfister  
Jim Berg  
Kevin McMullen

FROM: Ann Johnson 

RE: Material sampling requirements for SPS-9 experiments in Tomah and Waukesha, Wisconsin

Materials required for test pit sampling:

1. Approximately 100 burlap bags for bulk material samples  
One 200 pound sample required for each layer beneath the existing pavement
2. Sealable containers for moisture samples (quart jars work well)
3. Twine to tie bags
4. Something to wrap cores in (i.e. bubble wrap)
5. Tape - SHRP will supply labels
6. Equipment needed:  
Backhoe (and operator)  
Nuclear Density Gauge (and operator)  
Picks  
Shovels

Samples and cores are to be stored on site until further notice.

Also attached are testing requirements for each material. Kevin McMullen has SHRP protocol for each test.

SHRP will have a representative (Scott McLean) on site at the I-43 project field office at 8:00 am Monday, June 8. Mr. McLean will travel with the WISDOT coring crew to the I-94 project when they are completed on I-43. No SHRP representative will be on I-94 before then. Please call me at 1-800-344-7477 with any questions.

TABLE 1

## SPS-9 LABORATORY TESTING PLANS FOR REHABILITATION PROJECTS - EXISTING PAVEMENT

Material Type and Properties	SHRP Test	SHRP Protocol	Number of Tests	Samples
<b>EXISTING PORTLAND CEMENT CONCRETE</b>				
Splitting Tensile Strength	PC02	P62	9	C1-C9
PCC Coefficient of Thermal Expansion	PC03	P63	1	A1
Static Modulus of Elasticity	PC04	P64	1	A2
Core Examination / Thickness	PC06	P66	12	C1-C9, A1-A3
<b>EXISTING ASPHALT CONCRETE</b>				
Core Examination/Thickness	AC01	P01	15	C1-C12, A1-A3
Field Moisture Damage	AC08	P08	3	A1-A3
Resilient Modulus	AC07	P07	3	C1-C12
Tensile Strength	AC07	P07	3	(FROM Mr)
<b>EXISTING UNBOUND GRANULAR BASE</b>				
Particle Size Analysis	UG01	P41	3	BA1-3/TP1-3
Sieve Analysis (washed)	UG02	P41	3	BA1-3/TP1-3
Atterberg Limits	UG04	P43	3	BA1-3/TP1-3
Moisture-Density Relations	UG05	P44	3	BA1-3/TP1-3
Resilient Modulus (at in-situ density and moisture)	UG07	P46	3	BA1-3/TP1-3
Classification	UG08	P47	3	BA1-3/TP1-3
Natural Moisture Content	UG10	P49	3	BA1-3/TP1-3
In-Place Density and Moisture (Test Pits Only)	SHRP-LTPP Method		3	TP1-3
<b>EXISTING TREATED BASE</b>				
Type and Classification of Material and Treatment	TBO1	P31	3	A1-A3
Pozzolanic/Cementitious: Compressive Strength	TBO2	P32	3	A1-A3
Asphalt Treated: Dynamic Modulus (77°F)	TBO3	P33	3	C1-C9
HMAC: Resilient Modulus	AC07	P07	3	C1-C9
<b>SUBGRADE UNDER EXISTING PAVEMENT</b>				
Sieve Analysis	SS01	P51/51A	3	BA1-3/TP1-3
Hydrometer to 0.001mm	SS02	P42	3	BA1-3/TP1-3
Atterberg Limits	SS03	P43	3	BA1-3/TP1-3
Classification and Type of Subgrade	SS04	P52	3	BA1-3/TP1-3
Resilient Modulus (at in-situ density and moisture)	SS07	P46	3	BA1-3/TP1-3
Unit Weight (From UD samples)	SS08	P56	3	BA1-3/TP1-3
Natural Moisture Content	SS09	P49	3	BA1-3/TP1-3
In-Place Density and Moisture (Test Pits Only)	SHRP-LTPP Method		3	BA1-3/TP1-3
Depth to Rigid Layer	SHRP-LTPP Method		3	S1-3

TABLE 2

SPS-9 LABORATORY TESTING PLANS - SUBGRADE, SUBBASE AND BASE LAYERS  
FOR NEW AND RECONSTRUCTION PROJECTS

Material Type and Properties	SHRP Test	SHRP Protocol	Number of Tests	Samples
<b>UNBOUND GRANULAR BASE</b>				
Particle Size Analysis	UG01	P41	3	B4-B6
Sieve Analysis (washed)	UG02	P41	3	B4-B6
Atterberg Limits	UG04	P43	3	B4-B6
Moisture-Density Relations	UG05	P44	3	B4-B6
Resilient Modulus (at in-situ density and moisture)	UG07	P46	3	B4-B6
Classification	UG08	P47	3	B4-B6
Natural Moisture Content	UG10	P49	3	B4-B6
In-Place Density and Moisture	SHRP-LTPP Method		9	T10-T18
<b>TREATED BASE/SUBBASE</b>				
Type and Classification of Material and Treatment	TB01	P31	15	C1-C15
Pozzolanic/Cementitious: Compressive Strength	TB02	P32	6	C1-C6
Asphalt Treated (Low Quality): Dynamic Modulus (77°F)	TB03	P33	3	C1-C12
<b>ASPHALT TREATED BASE (High Quality)</b>				
Core Examination/Thickness	AC01	P01	18	C1-C21
Bulk Specific Gravity	AC02	P02	18	C1-C21
Maximum Specific Gravity	AC03	P03	1	BT-1
Asphalt Content (Extraction)	AC04	P04	1	BT-1
Moisture Susceptibility	AC05	P05	1	BT-1
Resilient Modulus	AC07	P07	3	C1-C12
Tensile Strength	AC07	P07		(FROM Mr)
<b>SUBGRADE</b>				
Sieve Analysis	SS01	P51/51A	3	B1-B3
Hydrometer to 0.001mm	SS02	P42	3	B1-B3
Atterberg Limits	SS03	P43	3	B1-B3
Classification and Type of Subgrade	SS04	P52	3	B1-B3
Resilient Modulus (at in-situ density and moisture)	SS07	P46	3	B1-B3
Unit Weight	SS08	P56	3	B1-B3
Natural Moisture Content	SS09	P49	3	B1-B3
In-place Density and Moisture	SHRP-LTPP Method		3	B1-B3

TABLE 3

SPS-9 LABORATORY TESTING PLANS- ASPHALT MIXES FOR  
OVERLAYS AND NEW/RECONSTRUCTION

Material Type and Properties	SHRP Test	SHRP Protocol	Number of Tests	Samples
<b>NEW ASPHALT CONCRETE</b>				
Core Examination/Thickness	AC01	P01	21	C1-C21
Bulk Specific Gravity	AC02	P02	21	C1-C21
Maximum Specific Gravity	AC03	P03	3	BV1-BV3
Asphalt Content (Extraction)	AC04	P04	3	BV1-BV3
Moisture Susceptibility	AC05	P05	3	BV1-BV3
Creep Compliance	AC06	P06	3	BV1-BV3
Resilient Modulus	AC07	P07	3	C1-C12
Tensile Strength	AC07	P07		(FROM Mr)
<b>AGGREGATES (Extracted from NEW Asphalt Concrete):</b>				
Bulk Specific Gravity:				
Coarse Aggregate	AG01	P11	3	BV1-BV3
Fine Aggregate	AG02	P12	3	BV1-BV3
Type and Classification	AG03	P13	3	BV1-BV3
Gradation of Aggregate	AG04	P14	3	BV1-BV3
NAA Test for Fine				
Aggregate Particle Shape	AG05	P14A	3	BV1-BV3
Coarse Aggregate Particle Shape	AG06	P14B	3	BV1-BV3
<b>ASPHALT CEMENT (Recovered from NEW Asphalt Concrete):</b>				
Penetration at 50°F, 77°F, 90°F	AE02	P22	3	BV1-BV3
Specific Gravity (60°F)	AE03	P23	3	BV1-BV3
Viscosity at 77°F	AE04	P24	3	BV1-BV3
Viscosity at 140°F, 275°F	AE05	P25	3	BV1-BV3

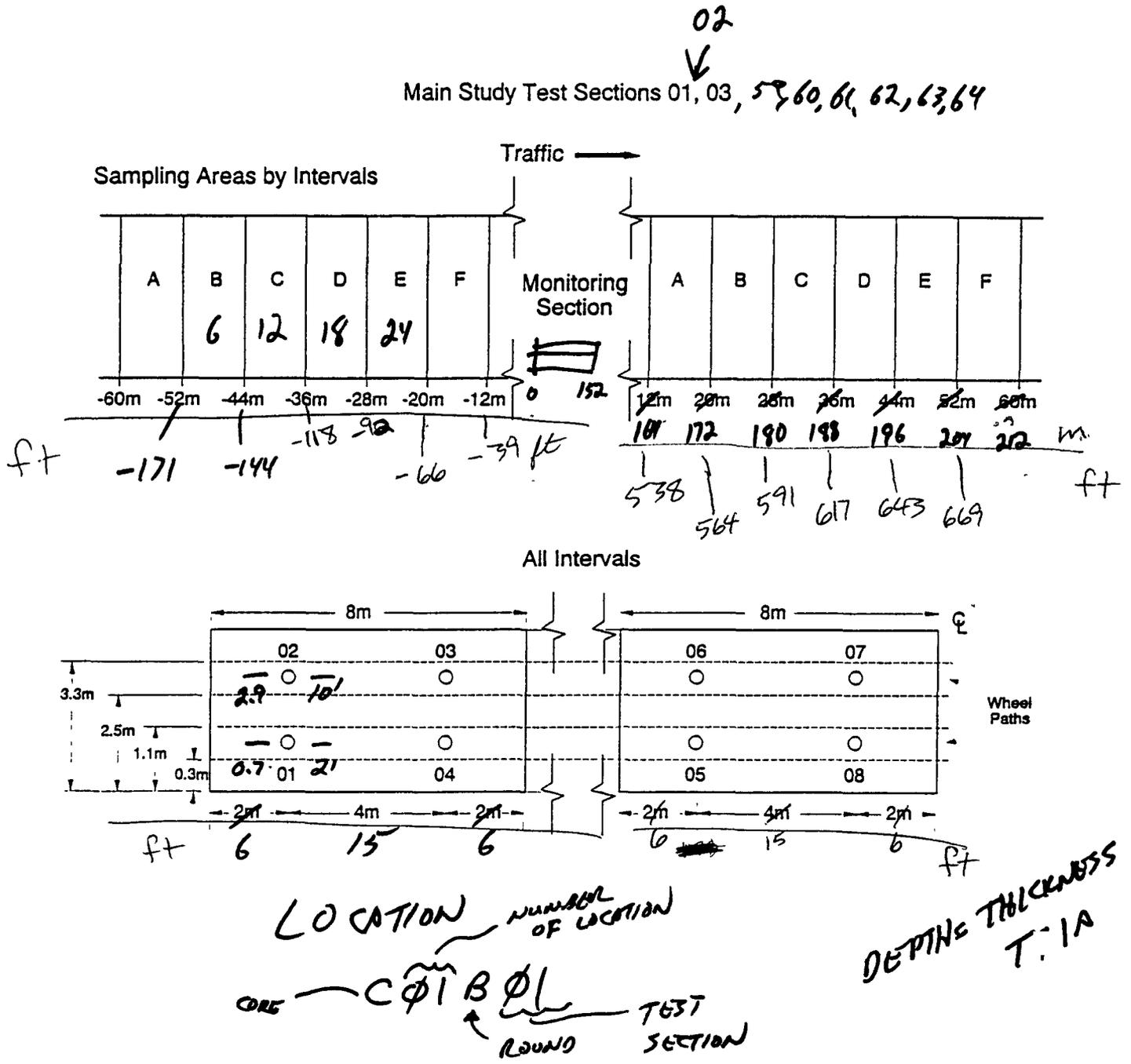


Figure 4. Core locations for Main Study test sections 01 and 03

Main Study Test Section 02

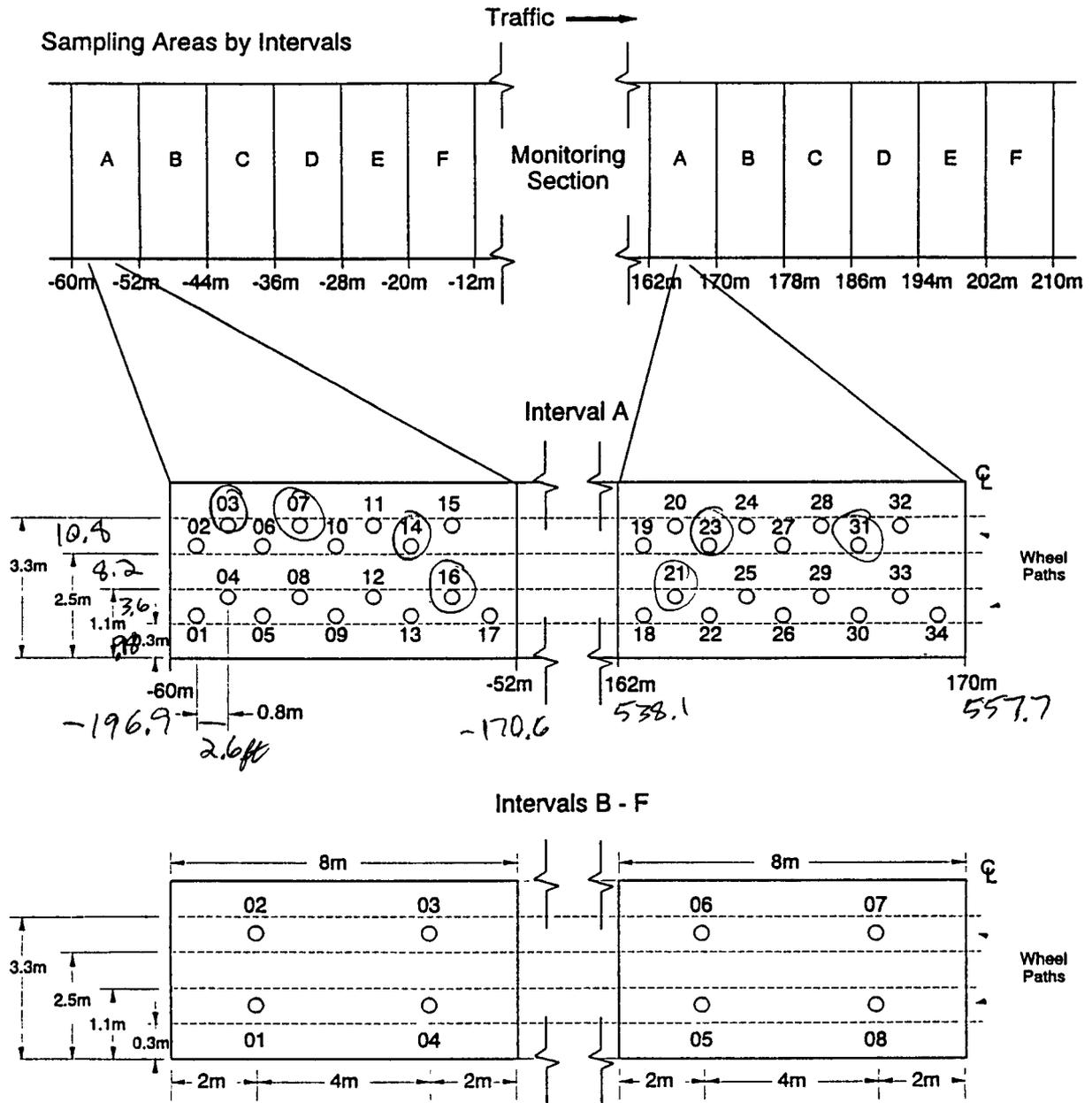


Figure 5. Core locations for Main Study test section 02, SUPERPAVE™ standard design mixture

GPS AC Overlays  
Tracking Table of Asphaltic Concrete Testing

Sample location number	Field set <sup>b</sup>	Sample number	Lab test number	Steps involved in laboratory handling and testing sequence							
				Required laboratory tests					Extra sample?	Sample storage	Sample disposed?
				First	Second	Third	Fourth	Substitute			
C6	2	CA06	1	AC01/P01				AC07/P07	Yes	(c)	No
C7	2	CA07	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07(ITS)		No	(c)	Yes
C8	2	CA08	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07(ITS)		No	(c)	Yes
C9	2	CA09	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07(ITS)		No	(c)	Yes
C10	2	CA10	1	AC01/P01	AC02/P02	AC07/P07(ITS)			No	(c)	Yes
C11	2	CA11	1	AC01/P01				AC07/P07	Yes	(c)	No
C12	2	CA12	1	AC01/P01				AC07/P07	Yes	(c)	No
A1	2	CA51	1	AC01/P01	AC02/P02	AC03/P03			No	(c)	Yes
BA1 <sup>a</sup>	2	CA61	1	AC04/P04	AG04/P14A	AG05/P14A			No	(c)	Yes
C18	2	CA18	2	AC01/P01				AC07/P07	Yes	(c)	No
C19	2	CA19	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07(ITS)		No	(c)	Yes
C20	2	CA20	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07(ITS)		No	(c)	Yes
C21	2	CA21	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07(ITS)		No	(c)	Yes
C22	2	CA22	2	AC01/P01	AC02/P02	AC07/P07(ITS)			No	(c)	Yes
C23	2	CA23	2	AC01/P01				AC07/P07	Yes	(c)	No
C24	2	CA24	2	AC01/P01				AC07/P07	Yes	(c)	No
A2	2	CA52	2	AC01/P01	AC02/P02	AC03/P03			No	(c)	Yes
BA2 <sup>a</sup>	2	CA64	2	AC04/P04	AG04/P14A	AG05/P14A			No	(c)	Yes

- (a) This 304-mm (12-in) core will not be sampled if approximately 13.6-22.6 kg (30-50 lb) of asphaltic concrete mix used in the construction of the AC overlay during construction and shipped to the laboratory. The bulk sample shall be tested in place of the 304-mm (12-in) core. Also, in place of the 304-mm (12-in) core, more 152-mm (6-in) cores may be obtained from one end of the test section. The material for three cores (from one end) shall be combined to perform the required testing procedures. Samples shall not be combined for testing from opposing ends of the test section.
- (b) The field set may be 2 or higher.
- (c) Sample storage: Asphaltic concrete cores and block samples should be stored flat side down, fully supported and at between 10°C (50°F) and 21°C (70°F) in an environmentally protected storeroom.

NOTES  
R E G N T B