Missouri (29)
SPS-6

soil
43980
(313) 454-0629

Post-It™ brand fax transmittal memo 7671 | # of pages ▸ 4

To CARY Keller	From BEN
Co	Co
Dept	Phone #
Fax # 3/8/95	Fax #

Kenneth W Kramer PE
Frank A Henderson PG
Garrett H Evans PE
Starr D Kohn PhD PE
Edward S Lindow PE
Robert C Rabeler PE
Gerald M Beltan PE
Robert E Zayko PE

Cheryl Kehres Dietrich CGWP
Larry P Jedele, PE
Gerard P Madej PE
Timothy H Bedenis PE
J William Coberly CET
Chuck A Gemayel PE
Truman F Maxwell, CPA
Timothy J Mitchell PE
John C Zarzecki CWI

March 3, 1995

Mr Ben Worel
Braun Intertec Corporation
6875 Washington Avenue South
P O Box 39108
Minneapolis, MN 55439-0108

CARY WE NEED DATA. NOT THIS INFORMATION WE ALREADY HAVE. PLEASE CALL ME IF DATA EXISTS 942-3057 BEN

Re: SPS-6 Missouri MST Field Set 2, Post-Construction
FHWA - LTPP
SME Project PP18400

Years of Service

Dear Ben.

Enclosed please find a copy of the Work Plan for the SPS-6 site located on I-35 in Harrison County, Missouri. The work plan contains the project specifications, materials sampling and testing plans, and background information regarding other testing conducted by the state. A copy of our correspondence with the state concerning testing on the post-construction cores is also included. Finally, the final layout for the test site is provided. The revised locations of test sections 260215 and 260216 are shown on this plan.

29? MISSOURI

Should you have any questions concerning the enclosed information, please contact our office.

Very truly yours,

SOIL AND MATERIALS ENGINEERS, INC.

PLEASE EXPLAIN THE FOLLOWING MAPS ORDER OF SECTION. I NEED A FINAL VERSION WITH DATES OF ANY CHANGES IN ORDER TO USE THE DATA FOR RIMS.

Cary T. Keller

Cary T Keller, P E

enclosures

pc. Gene Skok, BIP w/o enclosures
Richard Ingberg, Regional Engineer w/o enclosures

ALSO IF THEY USED THE PLAN ATTACHED FOR POST D&S ARE THE DATASHEETS MIXED-UP?

SO WHEN WAS THE CHANGE DATE FROM DAY 1.

BEN

WORK PLAN

SHRP SPS-6

ROUTE I-35

HARRISON COUNTY

MISSOURI HIGHWAY AND TRANSPORTATION DEPARTMENT

RESEARCH SECTION

DECEMBER 1991

REVISED

FEBRUARY 1992

INDEX

INTRODUCTION

I. DISTRESS SURVEY MAP

II. FWD TESTS

III. SAMPLING AND TESTING

IV. PHOTOGRAPHS

V. VIDEO LOG

VI. 5-PT CROSS-SECTIONS

VII. MONITORING

VIII. WORK REQUIREMENTS

ATTACHMENTS

1. TEST SECTION DESCRIPTION

2. JOB SPECIAL PROVISIONS

3. DISTRESS SURVEY MAP

4. FWD TEST PLAN

only copies included

5. PRE-CONSTRUCTION SAMPLE PLAN

6. PRE-CONSTRUCTION SAMPLE TESTING

7. CONSTRUCTION SAMPLES AND TESTS

8. 5-POINT CROSS-SECTIONING DATA SHEETS

9. TEST SECTION EVALUATION REQUIREMENTS

10. INDIVIDUAL TASK EQUIPMENT AND PERSONNEL NEEDS

11. FORM LIST

WORK PLAN

SPS-6

REHABILITATION OF JOINTED PCCP
Route I-35
Harrison County

INTRODUCTION

This experiment will evaluate rehabilitation techniques for jointed PCCP. Listed in **Attachment 1**, are the 16 test sections to be constructed as part of this project. Test sections will be referred to in this manual by the last two digits in the SHRP ID as the test section number. The Job Special Provisions are in **Attachment 2**. These Job Special Provisions were drafted based on the requirements listed in the SHRP Operational Memorandum No. SHRP-LTPP-OM-013. The Job Special Provisions include work requirements for the contractor and Construction Division which are needed to complete the required sampling and testing for evaluation of this project.

The work requirements which follow should be inclusive of all the possible work requirements which might be necessary, but additional work may develop during the project.

The Job Special Provisions contain a provision which requires a work schedule be provided by the contractor with changes to be made only in writing to the engineer. This is

to assist in the scheduling of work.

The following data or samples are to be collected:

I. Distress Survey Map

At each test section, a survey map of the South Bound Driving Lane (SBDL) will be made which denotes as, a minimum, the following:

A. Joints

B. Cracks

C. Pavement Repairs

D. Spalls

E. Joint and Crack Faults at 3′ and 9′

F. Hand Distance Wheel - Distance from tie point (0+00 station) for each joint or crack in a test section. The location of this measurement is to be on the pavement edge.

G. FWD DMI measurement from each tie point (0+00 station) to joint and center of slab or other FWD test location.

H. Photograph locations

I. Joint and Crack Sealing locations

J. Diamond Grinding

K. Other items as determined during the surveys

The survey map formats are shown in **Attachment 3**. There are 3 forms of survey maps and each test section will use the combination of forms as outlined in the **Attachment 3**. The

survey map will include the preparation limits associated with each test section, typically 700 feet.

The SHRP Operational Guide No. SHRP-LTPP-OG-002, "Distress Identification Manual for the Long-Term Pavement Performance Studies" will be used to identify and rate the pavement distress when notations are made on the survey map.

The survey map will be established prior to construction beginning. Updates will be made as the following operations are completed:

A. Pavement Repairs

B. Break and Seat

C. Rubblizing

D. Asphalt Overlay Completed

The break and seat and rubblized sections will be mapped for a random 10% of the study limits during break and seat or rubblizing operations. This will be six 10′ x 12′ areas located near the nuclear density test locations.

Other surveys may be conducted, as necessary, during construction. The first post-construction survey will be made prior to December 1, 1992, if none are required in the interim. Then surveys will be conducted every 6 months as a minimum. Post-construction surveys should include 5-Pt cross-sections to evaluate rutting.

The survey map will be made and updated by the research section.

II. FWD Tests

FWD testing will be conducted as specified in the FWD test plan for the SPS-6 project which is in **Attachment 4.** These following modifications are made.

Table 2, page 7, is replace with the following table 2.

TABLE 2

TEST SECTION NUMBER	"BEFORE"	"DURING"					"AFTER"
	TASK 6	TASK 10	TASK 14	TASK 15	TASK 20	TASK 22	TASK 32
1	RIGID	NONE	NONE	NONE	NONE	NONE	RIGID
2	RIGID	NONE	NONE	NONE	NONE	NONE	RIGID
3	RIGID	NONE	NONE	NONE	NONE	NONE	RIGID
4	RIGID	NONE	NONE	NONE	NONE	NONE	RIGID
5	RIGID	RIGID	RIGID	NONE	NONE	NONE	RIGID
6	RIGID	RIGID	RIGID	NONE	NONE	NONE	RIGID
7	RIGID	NONE	NONE	MOD	MOD	MOD	FLEX
8	RIGID	NONE	NONE	MOD	MOD	MOD	FLEX
9	RIGID	NONE	NONE	MOD	MOD	MOD	FLEX
10	RIGID	NONE	NONE	MOD	MOD	MOD	FLEX
11	RIGID	NONE	NONE	MOD	MOD	MOD	FLEX
12	RIGID	NONE	NONE	MOD	MOD	MOD	FLEX
13	RIGID	NONE	NONE	MOD	MOD	MOD	FLEX
14	RIGID	NONE	NONE	MOD	MOD	MOD	FLEX
15	RIGID	NONE	NONE	NONE	NONE	NONE	RIGID
16	RIGID	RIGID	RIGID	NONE	NONE	NONE	RIGID

TASK 6 - PRE-CONSTRUCTION TESTING

TASK 10 - TESTING DURING CONTRACT DEFLECTION TESTING

TASK 14 - TESTING DURING CONTRACT DEFLECTION RETESTING

TASK 15 - TESTING PRIOR TO BREAKING OR RUBBLIZING

TASK 20 - TESTING PRIOR TO SEATING OR COMPACTING

TASK 22 - TESTING AFTER SEATING OR COMPACTING

TASK 32 - TESTING 1-3 MONTHS AFTER PLACEMENT OF THE OVERLAY

The test types are defined as follows:

RIGID - This testing is the same as figure 3, page 17, of the SHRP test plan except in pass 2 there will be a test point labeled, J2A, on the approach slab corner There will be a test point in pass 4 labeled, J6, at the center of the slab in the outer wheel path with the sensors as shown in figure 1, Deflection Basin Testing.

MODIFIED (MOD) The test points, 1 and 6, as tested in the RIGID will be tested as shown in figure 4, page 18.

FLEX - This testing will be as shown in figure 5, page 20.

Other general changes will be:

1.) The load sequence will be as defined for "FLEX" on page II-12 of the SHRP-LTPP Manual for FWD testing for <u>all testing</u>.

2.) The drop repetitions will be the same as for "FLEX" as defined on page II-15 of the same manual above.

A strip map for the DMI locations will be completed as part of Task 6. The form to be used will be number 3 in **Attachment 3.**

This testing is to be done by the Research section.

III <u>Sampling and Testing</u>

A. <u>Prior to Construction</u>

The samples, data sheets and tests as required by SHRP in Operational Memorandums No. SHRP-LTPP-OM-(019 and 023) and the sample plan in **Attachment 5** will be collected.

These samples or tests will have to be obtained by a

combined effort of the Research Section, Soils and Geology Section, Maintenance, and Construction Divisions.

The sampling and testing will be supervised by Research. Traffic control during sampling will be by Maintenance. The 6" cores will be retrieved with a core drill truck. The 4" cores will be retrieved by the Research drill.

For test pits:

A. Sawing and removal by Maintenance (diamond saw and backhoe).
B. Sampling by Research (moisture and bulk samples)
C. Nuclear testing by Construction (moisture and density tests)
D. Replacement by Maintenance

The shoulder probes will be made by Soils and Geology. The thin walled Shelby tube or split spoon samples will be obtained by Soils and Geology.

B. Laboratory Testing of Samples

The tests to be conducted on the above samples are listed in **Attachment 6**. The SHRP protocol for testing of the samples will be followed. The testing of these samples will be by the physical lab, research section and soils and geology as

specified in **Attachment 6**.

C. Construction Sampling and Testing

During construction, sampling and testing requirements as described in SHRP Operational Memorandums No. SHRP-LTPP-OM(019 and 023) will be completed. There are samples of the data sheets to be completed shown in the memorandums. Forms for each test section have been pre-assembled into booklets to ensure all the proper forms are on hand to record the data.

Several specific items as mentioned below which will require special attention:

1. During the replacement of concrete at pavement repair locations there will be specimens made for third point flexural strength testing and compressive strengths. Specimens will be made for each day of pavement repair in the test sections study lane. The specimens will be tested at 14 and 28 days of age.

This is to be done by Research.

2. During the joint and crack and saw and seal operations measurements of the reservoir size will be necessary.

3. During undersealing the time elapsed during grout

installation will be recorded to the nearest second. The construction records of deflection testing and reason for ceasing the grouting will be retrieved.

4. The sampling of loose bituminous material from the roadway will be at the lead-in and lead-out of each test section. The samples will be taken out of the paving hopper in the middle of an unloading truck or out of the truck bed. These samples will be four (4) 2 gallon buckets which will be quartered to one sample box, size (20 lb.), and a sample for nuclear content testing.

Each day of Asphaltic Concrete placement two boxes, 20 lbs. each, will be collected for tests specified in the table in **Attachment 7.**

The collection of loose mix material for testing will be by the Research Section.

5. The tests of samples will be as required in table 4 of the operational memorandum 019, page 12. The required tests and samples are listed in **Attachment 7.**

6. The testing of samples for asphalt content by nuclear gauge will be by the Construction Division. These samples will be collected by the Research Section and then after testing by Construction a determination of asphalt content by

extraction. The determination of asphalt content by extraction will be conducted by the Chemical Lab.

The sample after testing in the gauge will be placed in a box for shipment to the laboratory. The sample will be tested in the laboratory for extraction percent asphalt cement and maximum specific gravity as specified in the table in **Attachment 7.** The extracted asphalt cement and the aggregate will be combined to complete some of the remaining tests in the table in **Attachment 7.**

7. The samples of asphalt cement will be collected by the Research Section and tested for properties as required for trial mix asphalt by the chemical lab. Asphalt cement samples encompassing each day's production when test sections, SBDL only, layers are being placed. Samples will be one(1) gallon each.

8. During construction, compacted samples of each layer in a test section for tests will have to be collected. The tests are outlined in the table in **Attachment 7.** There is also a core location sketch in **Attachment 7.** These samples are to be taken by Research and are part of the required tests samples for the nuclear density testing. The testing of the samples will be as outlined in the SHRP protocols listed in the table in **Attachment 7.** All core samples are to be saved for alternate testing as described in the table. There are SHRP

required locations for the cores which is incorporated in the core location sketches.

The core samples will be tested by the Central Laboratory or the Research Section as outlined in **Attachment 7**. The samples will be from the total asphaltic concrete thicknesses place to date.

9. In addition to the cores there will be nuclear density tests conducted at the core locations and within the study limits for each lift in each test section. There should be tests conducted on the base pavement prior to the overlay tests. These test locations will be along three longitudinal lines 3', 6', and 9' from the pavement edge. There will be three tests per line, totaling nine tests per test section. The selected test locations will remain the same for each test section for each test on each layer as outlined in **Attachment 7** in the location sampling sketch, for the IC layer. Equipment for the testing will be from Construction. The tests will be conducted as specified in the Field Office report on the density of Asphaltic Concrete by Nuclear Gauge. The nuclear density tests will be conducted by Construction and monitored by the research engineer.

10. There is also required bulk samples of asphalt cement, graded aggregate, and bituminous mixture which will have to be collected and sent to SHRP. They are as follows:

Asphalt Cement - Eleven 5 gallon containers

Aggregate - 1000 lbs in 55 gallon drums

Asphaltic Concrete - 200 lbs in 5 gallon containers

There will be samples of the materials used in the production of the mixtures collected for future testing by the department with the procedures to be established from the SHRP Asphalt Research. These samples will be twenty bags of each fraction of aggregate for each type mixture used. There will be ten 5 gallon containers of asphalt cement collected. The hydrated lime and mineral filler used will not be sampled at the time of production. Future samples of these materials will be made when testing is initiated.

These samples will be collected by either Materials, Research or Construction personnel at the plant site. A sample of the material being placed in the containers will be collected and tested by the Central Laboratory prior to shipping to SHRP or storage of our samples to ensure representative samples.

11. The above listed tasks will be defined in a field workbook for each test section for which the task is appropriate. The workbooks will be:

1. Pavement Elevations
2. Pavement Density
3. FWD Tests
4. General
5. Pavement Surveys

IV. Photographs

Photographs of the pavements and associated operations will be made throughout the pre-construction, construction, and post-construction period.

In each test section, a photograph of each joint or crack in the SBDL should be made during the pre-construction, just prior to overlay and just after overlaying observations.

The photographs will be taken by the research section.

V. Video Log

The photo lab should be directed in obtaining a video log of all operations on this project.

VI 5-Pt. Cross-sections

The Construction Division will conduct 5-pt sectioning at 50 foot intervals. These should be taken with a EDM and theodolite so as to reproduce the location of the elevation measurement. Typical data forms are shown in **Attachment 8.**

A tie point will be set from which to measure elevation and distance. This tie point will maintain a constant assumed elevation. The tie point will be used to determine the beginning of the test section study limits.

Construction will be asked to map each test section with a EDM and theodolite from the tie point so as to be able to recreate the joint locations at the edge of the pavement. This is necessary to allow proper location of the edge joint test with the FWD.

VII Monitoring

Monitoring of all project phases will be conducted by research for compliance of SHRP requirements and future information needs for analysis.

VIII. Work Requirements

The pre-construction FWD tests and sampling will require a considerable size crew and organization. Estimated is the

following personnel and equipment.

A. Research

1. Two engineers
2. Four technicians
4. Drill truck
6. Crash truck
7. Tie point material
8. Camera
9. Sample containers

B. Soils and Geology

1. Drill truck and operator
2. Shelby Tubes

C. Maintenance

1. Saw and operator
2. Backhoe and operator
3. Pavement replacement crew

D. Construction

1. Nuclear gauge and operator

This work should only take 3 days.

During construction it will take one Research engineer to follow and record field work throughout the project.

In **Attachment 9** there is a test section accounting of work to be done , who's to do, the amount of time estimated to

do it and the number of times to be completed.

During Crack/Break and Seat Operation and Rubblizing, it will require the FWD crew. The extra personnel from the crew can help the project engineer in mapping and sampling.

During underseal operation, it will require the FWD, two crash trucks, and operators.

During paving, it will require the project engineer and three technicians for sampling and testing.

The project will possibly take most of the summer to complete.

A per task accounting of the equipment and personnel needed is in **Attachment 10.**

ATTACHMENT 1

TEST SECTIONS

SHRP ID & Test Section Number	Preparation Limits / Study Limits	General Description
290607	1394+00 to 1401+00	Geocomposite Edge Drain
	/1395+00 to 1400+00	Crack/Break and Seat
		4" Asphalt Overlay
290609	1418+00 to 1424+00	Crack/Break and Seat
	/1418+50 to 1423+50	4" Asphalt Overlay
290610	1428+00 to 1435+00	Shoulders Widened
	/1429+00 to 1434+00	Crack/Break and Seat
		8" Asphalt Overlay
290608	1435+00 to 1441+00	Shoulders Widened
	/1435+50 to 1440+50	Geocomposite Edge Drain
		Crack/Break and Seat
		8" Asphalt Overlay
290612	1455+00 to 1461+00	Shoulders Widened
	/1455+50 to 1460+50	Geocomposite Edge Drain
		Rubblizing Existing PCCP
		8" Asphalt Overlay

SHRP ID & Test Section Number	Preparation Limits / Study Limits	General Description
290614	1461+00 to 1468+00	Shoulders Widened
	/1462+00 to 1467+00	Rubblizing Existing PCCP
		8" Asphalt Overlay
290613	1472+00 to 1479+00	Rubblizing Existing PCCP
	/1473+00 to 1478+00	4" Asphalt Overlay
290611	1480+00 to 1487+00	Geocomposite Edge Drain
	/1481+00 to 1486+00	Rubblizing Existing PCCP
		4" Asphalt Overlay
290605	1501+50 to 1512+50	Pavement Repair
	/1502+00 to 1512+00	Joint and Crack Sealing(Concrete)
		Undersealing
		Geocomposite Edge Drain
		Diamond Grinding
		Asphalt Shoulders
290601	1512+50 to 1519+50	Control Section
	/1513+50 to 1518+50	

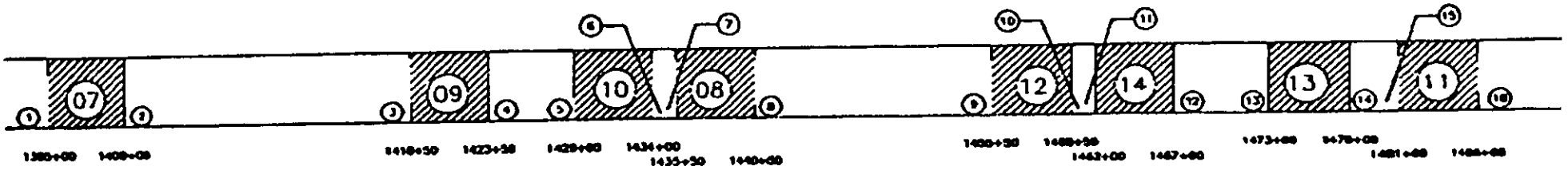
SHRP ID & Test Section Number	Preparation Limits / Study Limits	General Description
290602	1520+00 to 1531+00	Pavement Repair
	/1520+50 to 1530+50	Joint and Crack Sealing (Concrete)
		Asphalt Shoulders
		Possible Diamond Grinding
290604	1541+00 to 1548+00	Pavement Repair
	/1542+00 to 1547+00	4" Asphalt Overlay
		Joints in Bituminous Overlay
290603	1555+00 to 1561+00	Pavement Repair
	/1555+50 to 1560+50	4" Asphalt Overlay
290606	1561+00 to 1567+00	Pavement Repair
	/1561+50 to 1566+50	Undersealing
		Geocomposite Edge Drain
		4" Asphalt Overlay
290616	1581+00 to 1588+00	Pavement Repair
	/1582+00 to 1587+00	Joint and Crack Sealing
		Undersealing
		Possible Diamond Grinding
		Asphalt Shoulders
290615	1607+00 to 1614+00	Project Typical
	/1608+00 to 1613+00	

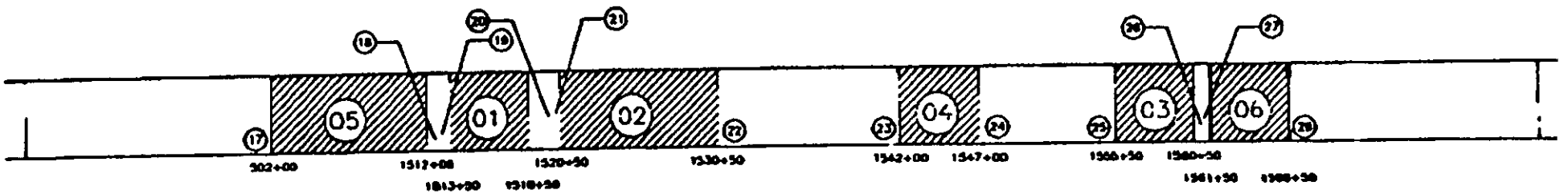
Different from page 25

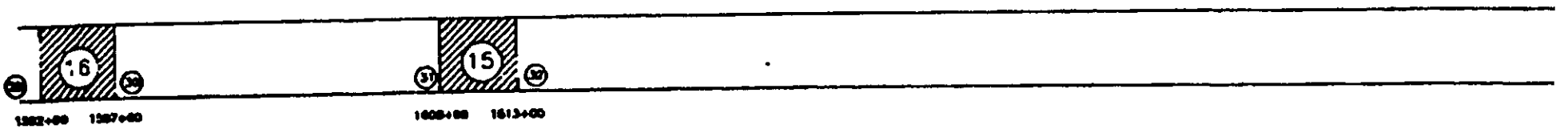
ATTACHMENT 5

PRE-CONSTRUCTION SAMPLE PLAN

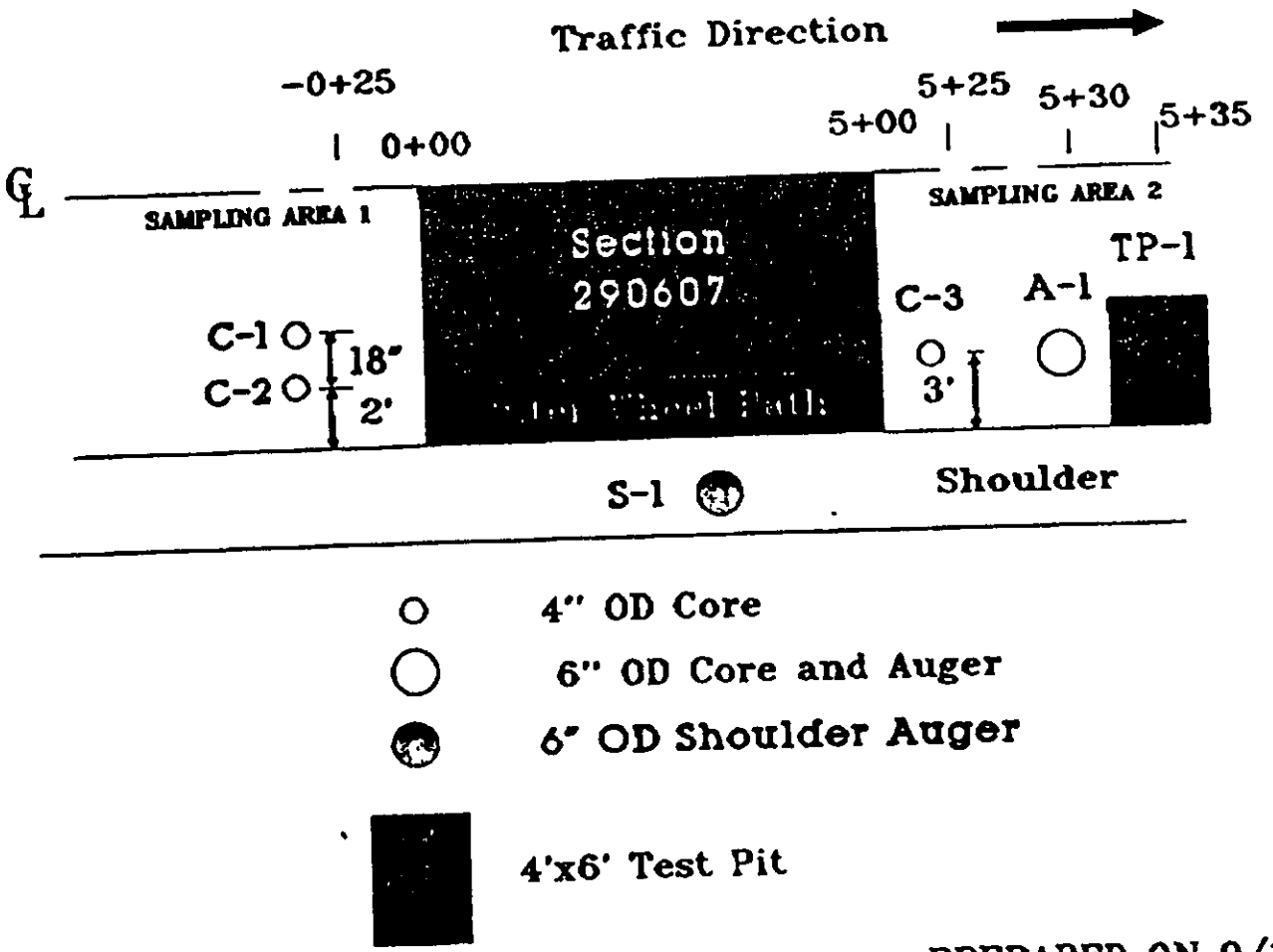
PRE-CONSTRUCTION SAMPLING PLAN
MISSOURI SPS-6 SITE
I-35, HARRISON COUNTY
SHRPID = 2906**







"Pre-Construction" Sampling Plan
Missouri SPS-6

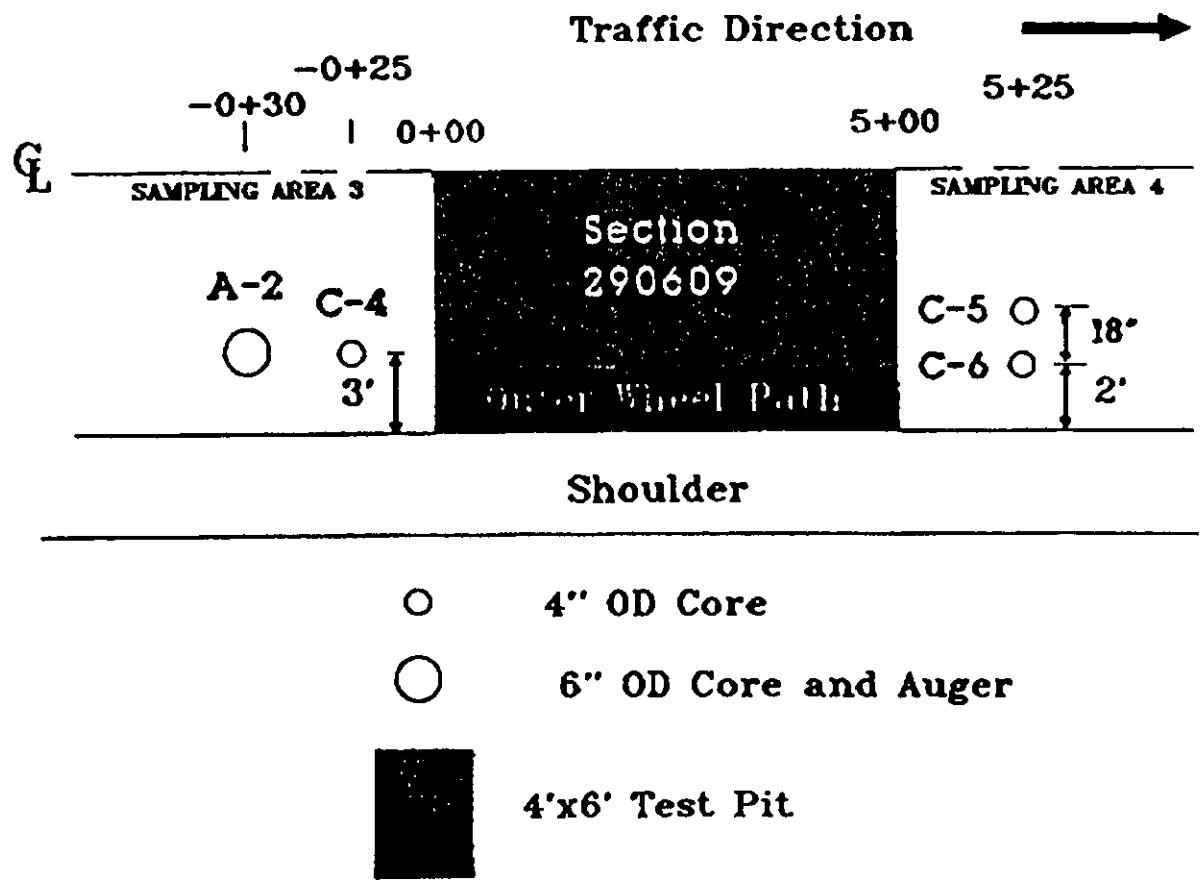


0

PREPARED ON 9/26/91
PAGE 1 OF 16

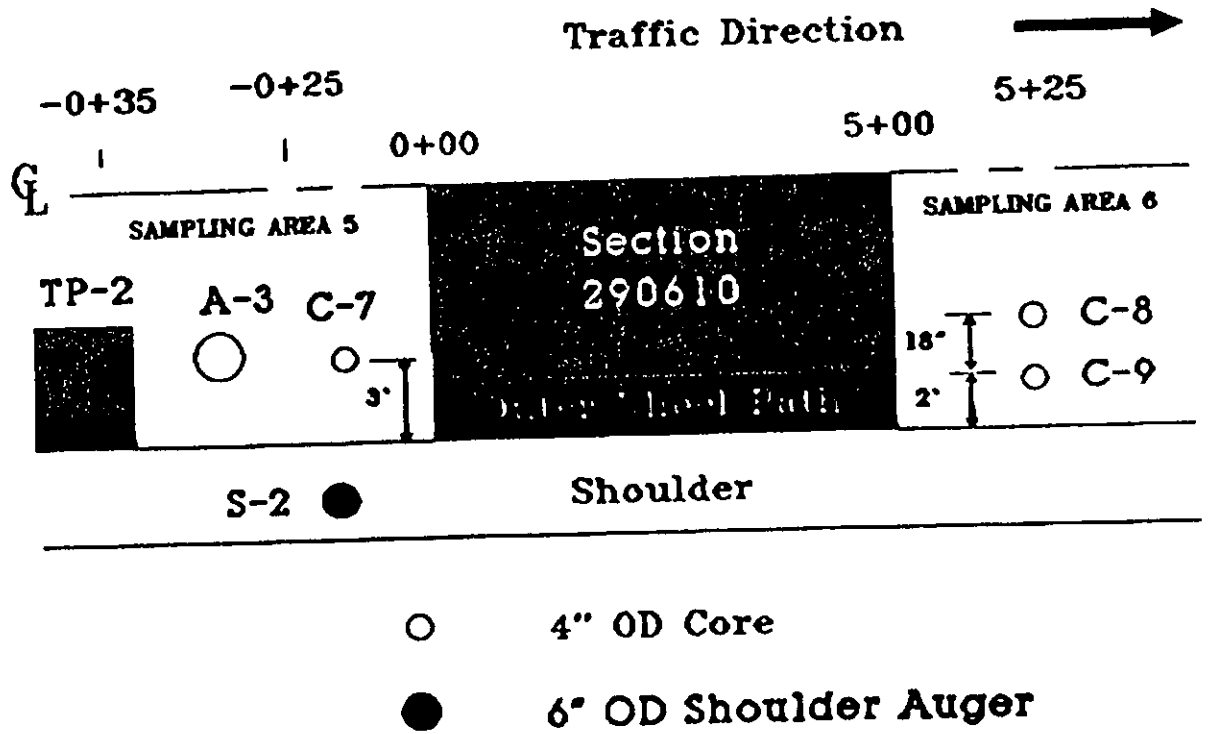
I-35, Harrison County

"Pre-Construction" Sampling Plan
Missouri SPS-6



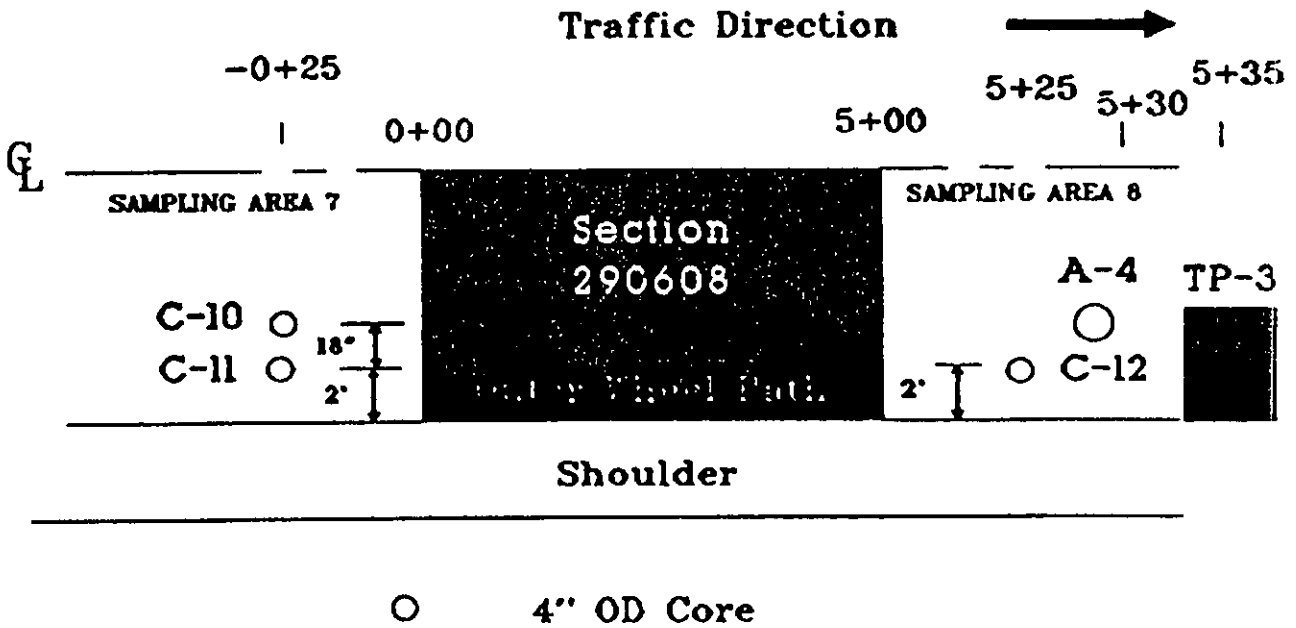
0

"Pre-Construction" Sampling Plan
Missouri SPS-6



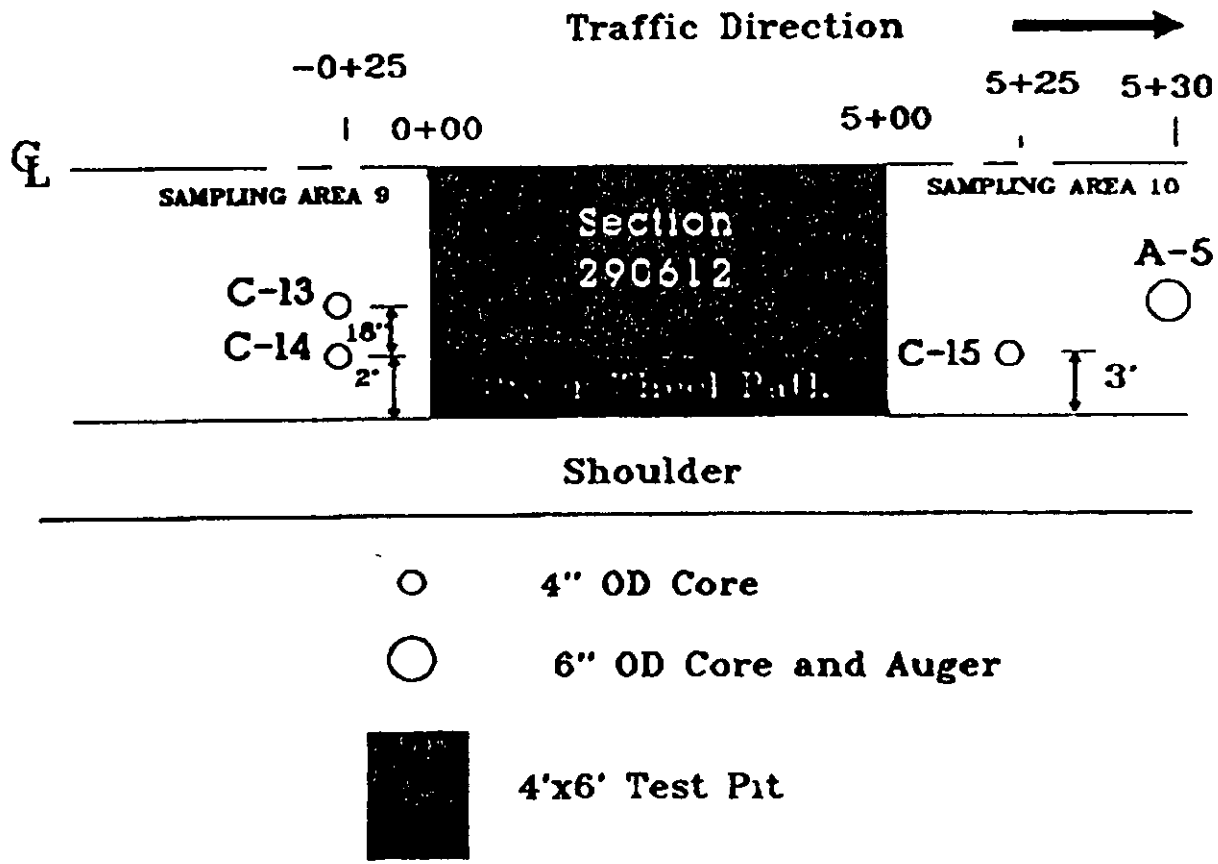
0

"Pre-Construction" Sampling Plan
Missouri SPS-6



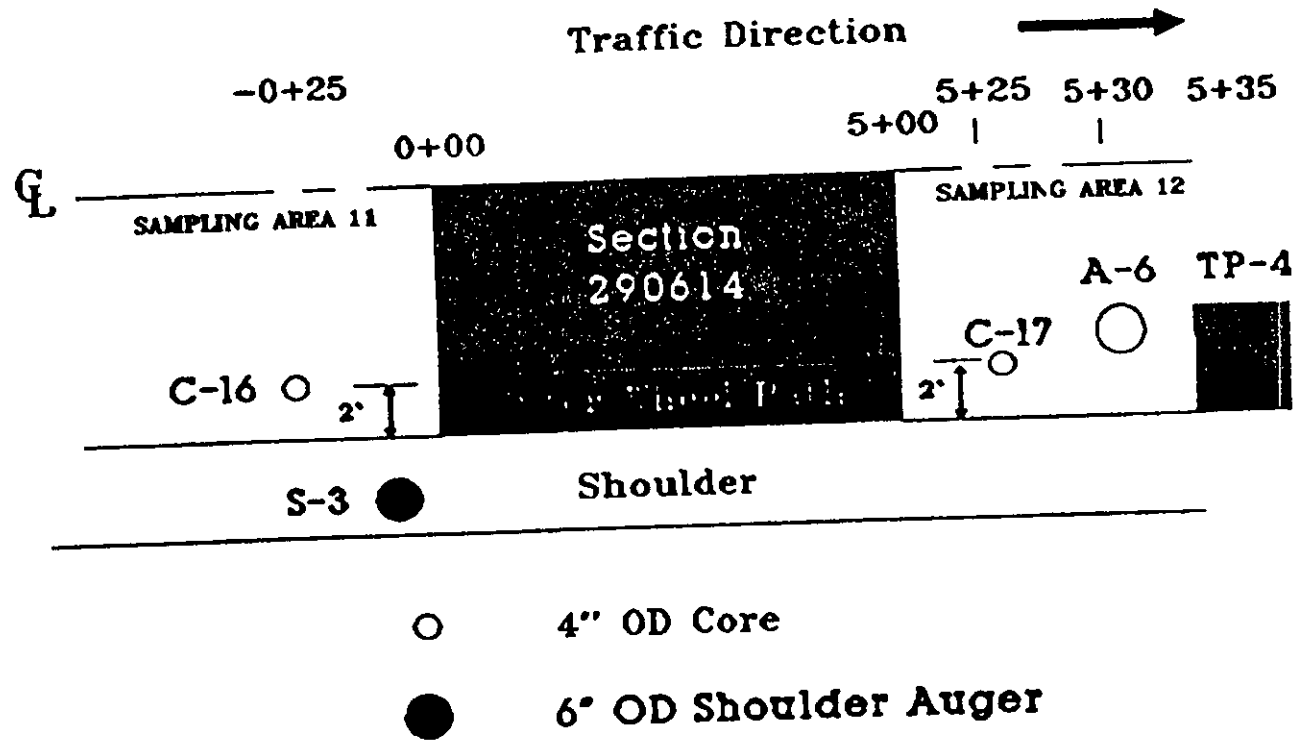
0

"Pre-Construction" Sampling Plan
Missouri SPS-6



0

"Pre-Construction" Sampling Plan
Missouri SPS-6

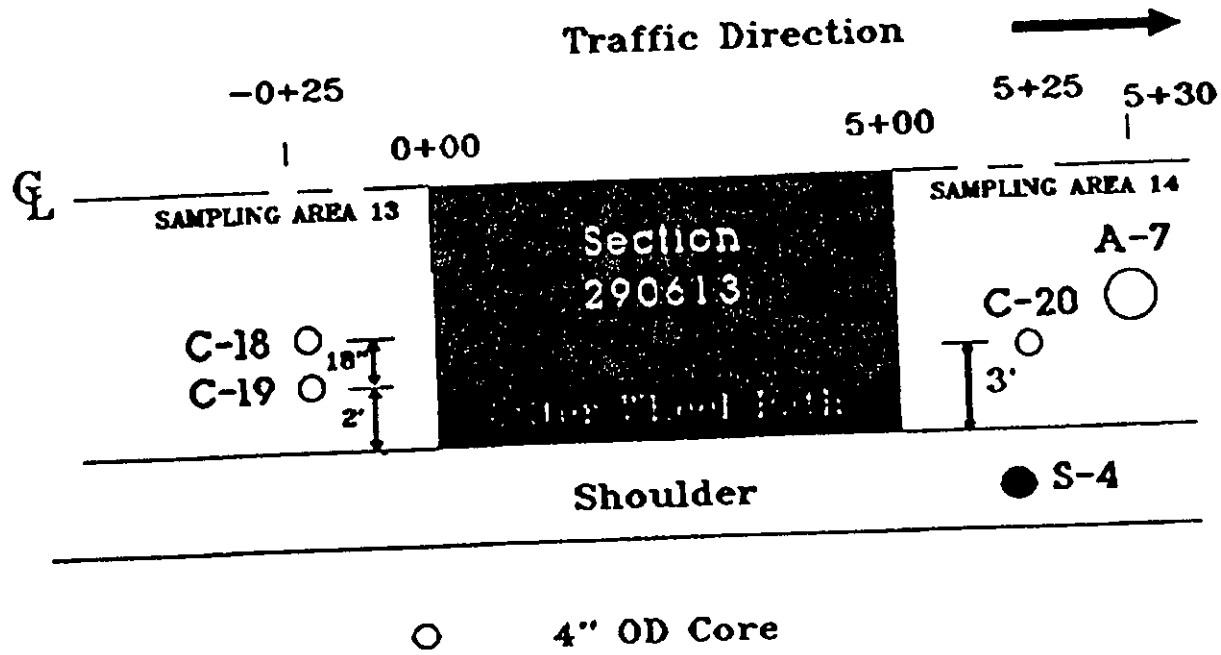


0

I-35, Harrison County

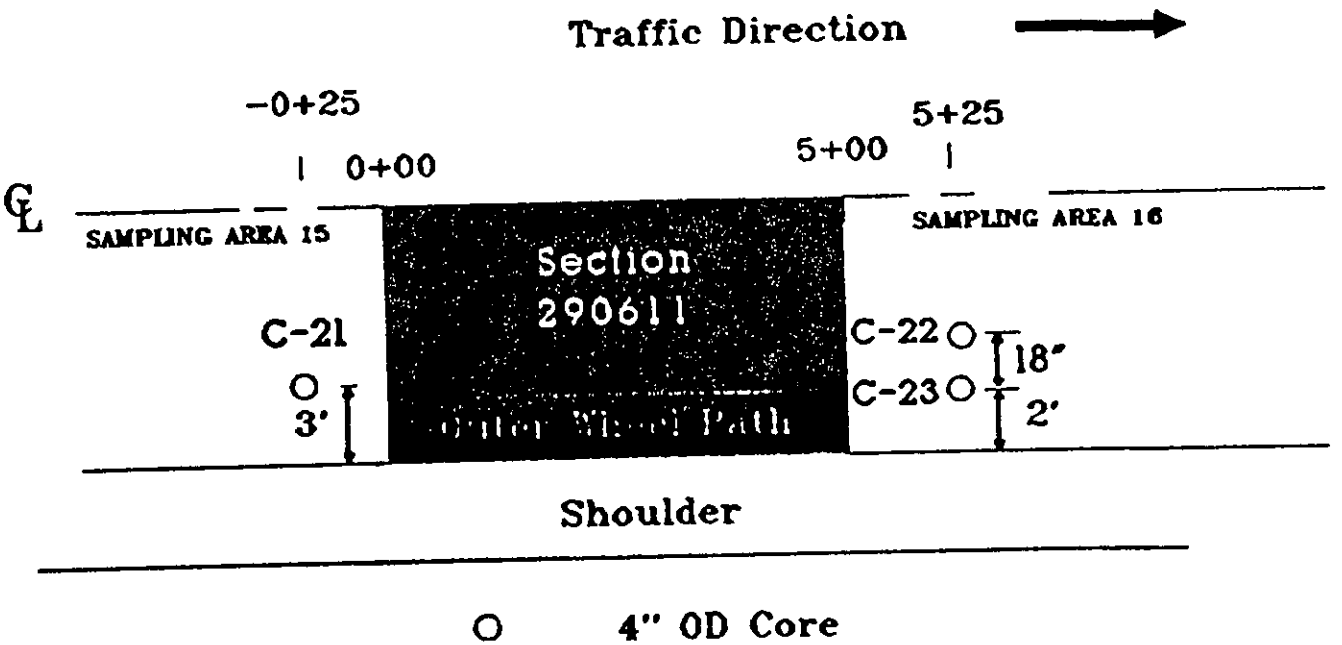
PREPARED ON 9/26/91
PAGE 6 OF 16

"Pre-Construction" Sampling Plan
Missouri SPS-6



0

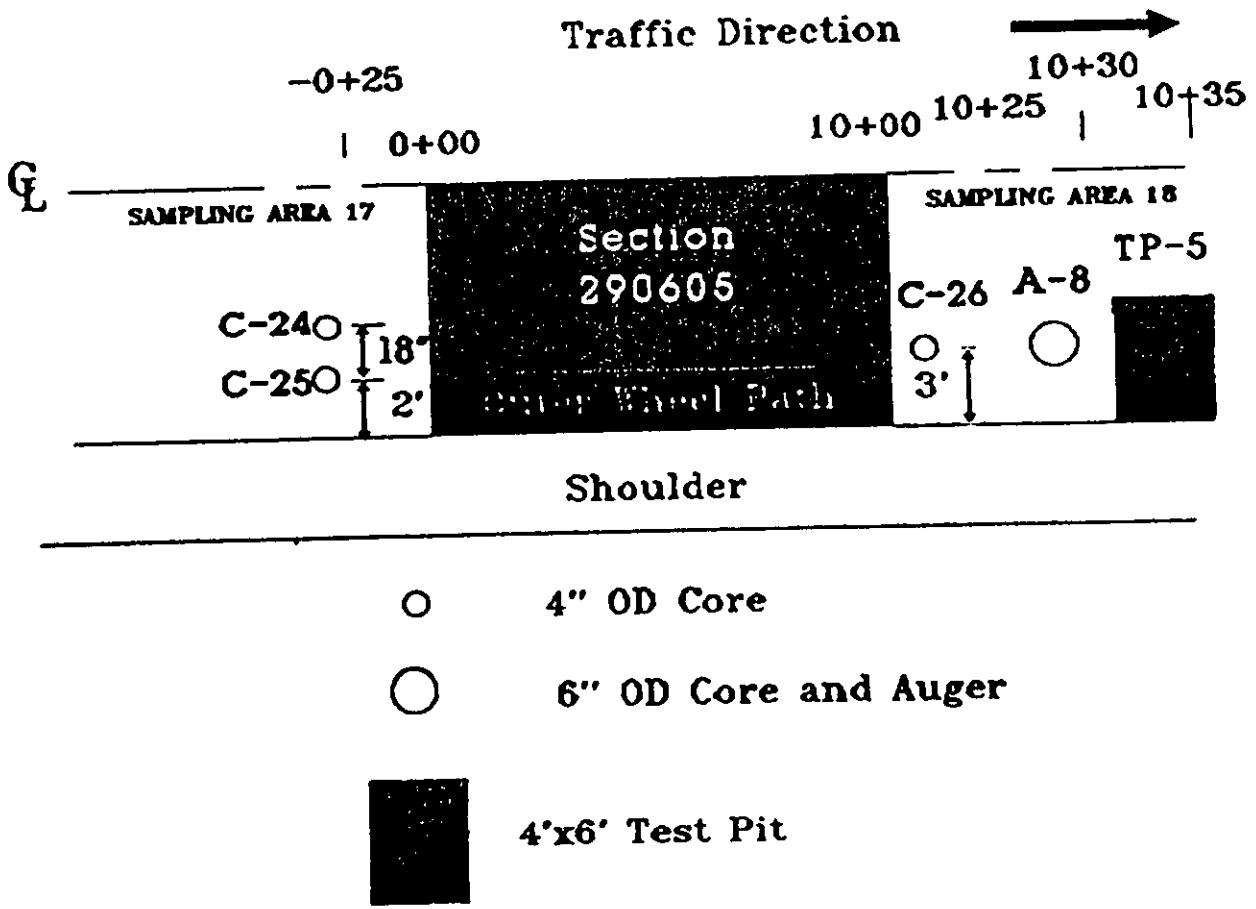
"Pre-Construction" Sampling Plan
Missouri SPS-6



0

I-35, Harrison County

"Pre-Construction" Sampling Plan
Missouri SPS-6

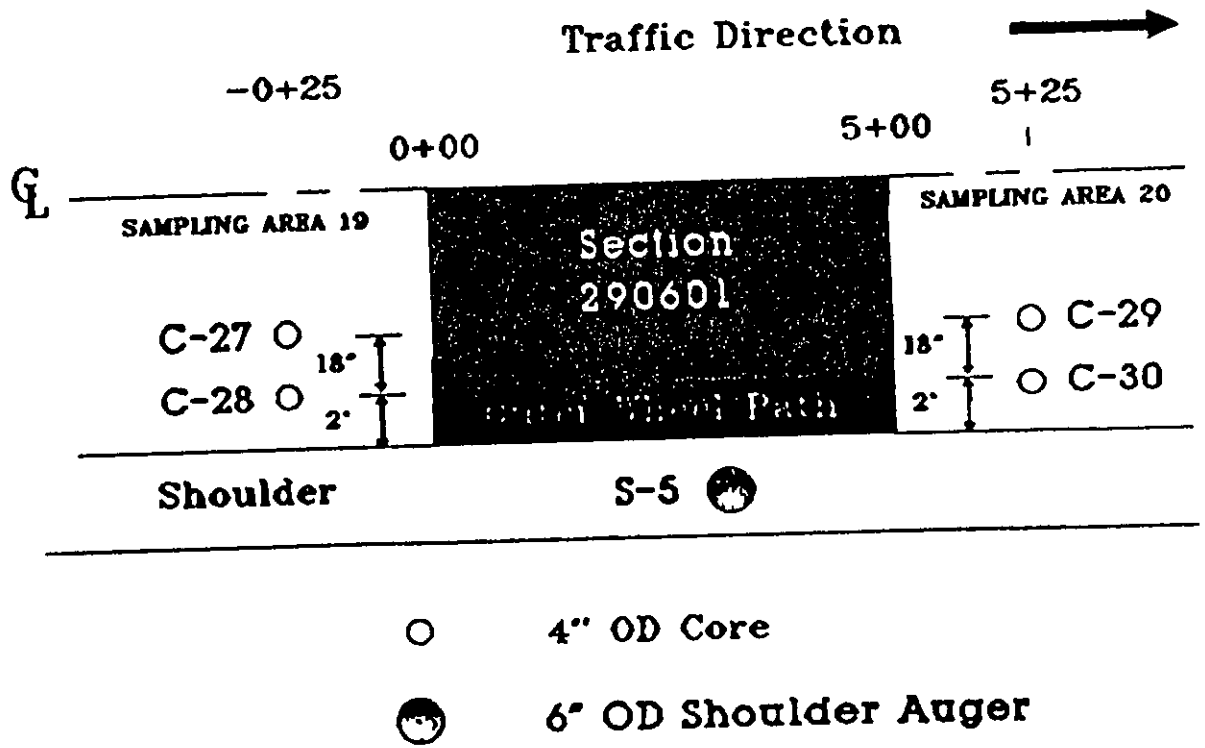


0

I-35, Harrison County

PREPARED ON 9/26/91
PAGE 9 OF 16

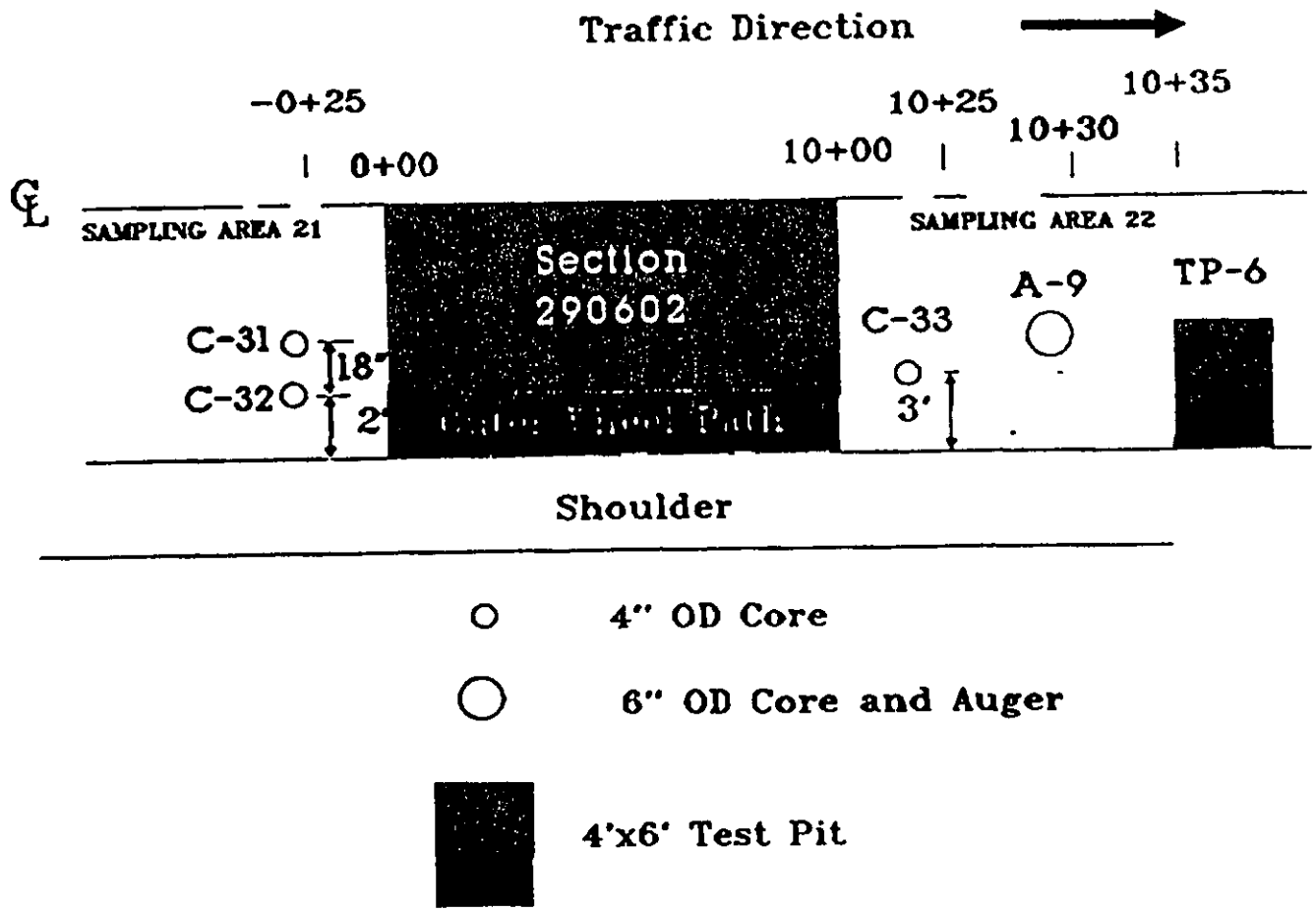
"Pre-Construction" Sampling Plan
Missouri SPS-6



0

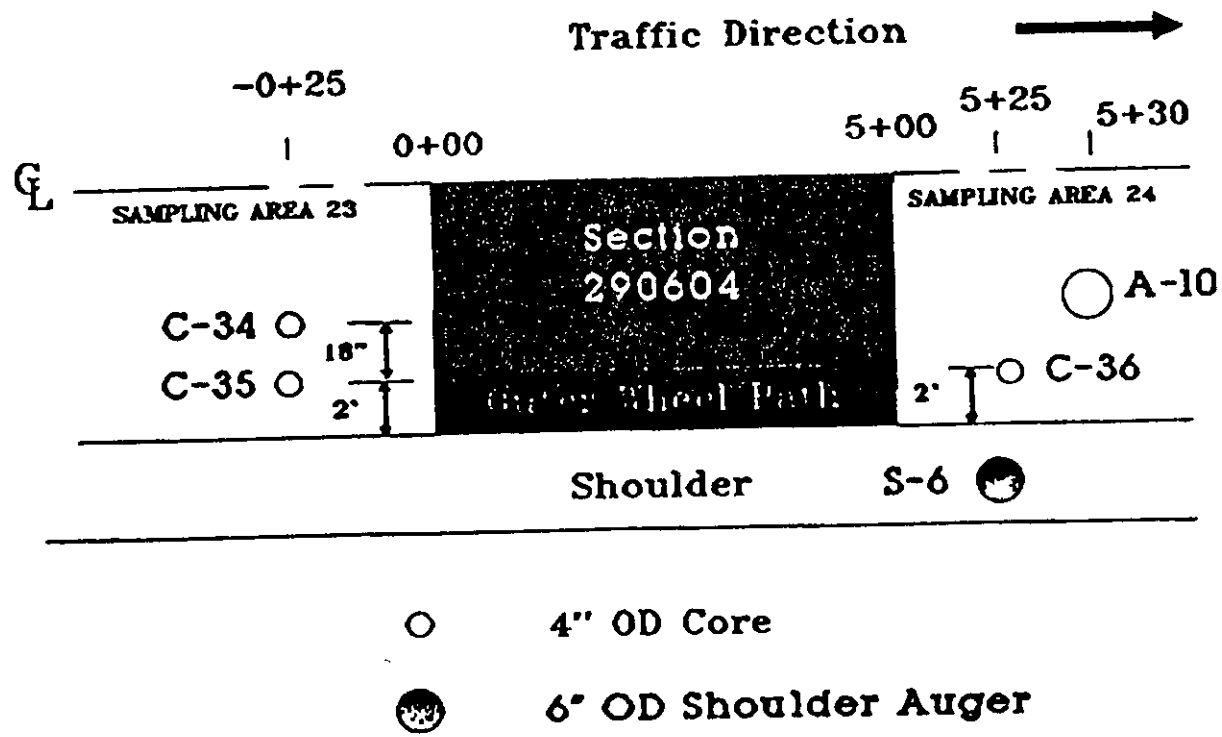
"Pre-Construction" Sampling Plan

Missouri SPS-6



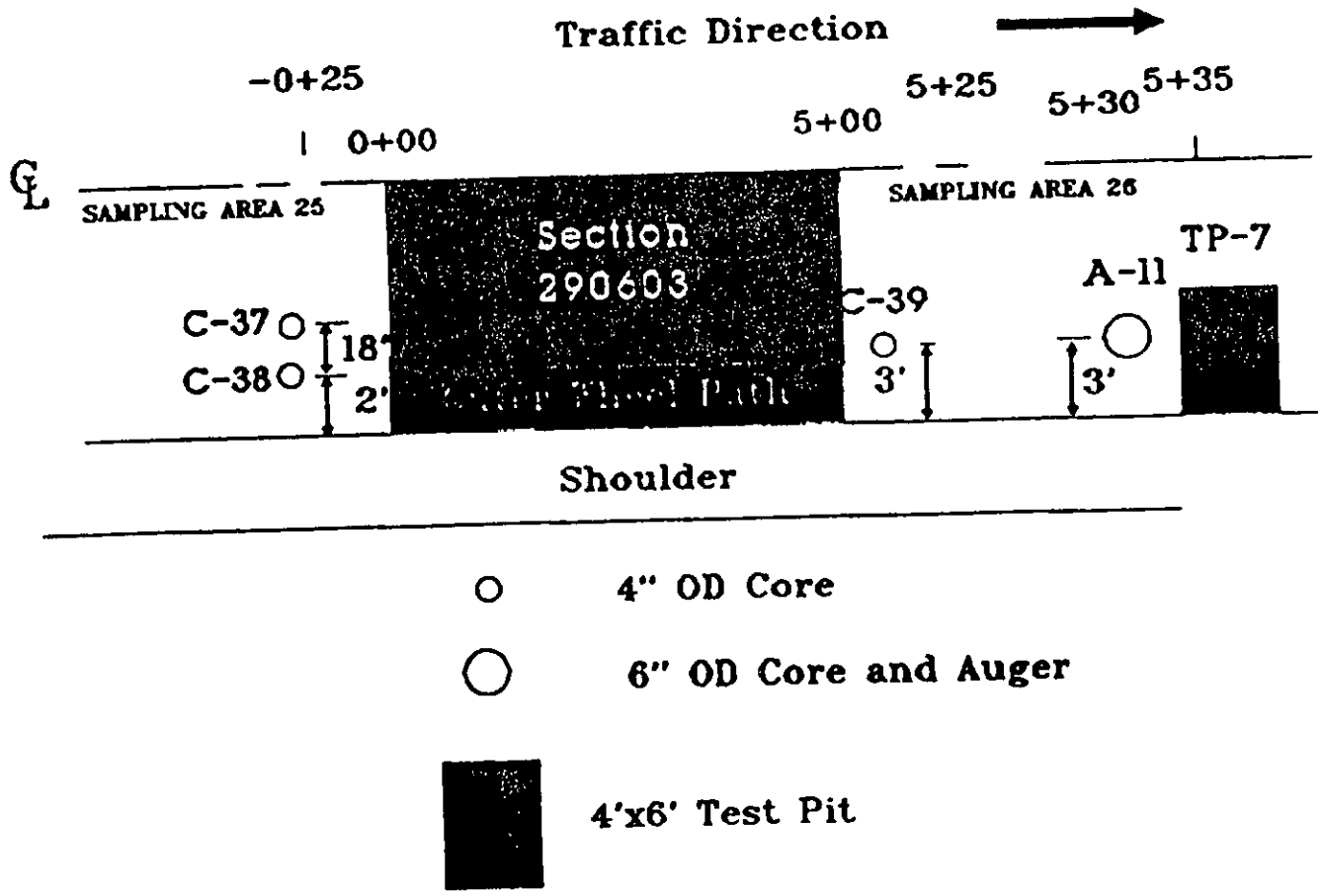
0

"Pre-Construction" Sampling Plan
Missouri SPS-6



0

"Pre-Construction" Sampling Plan
Missouri SPS-6

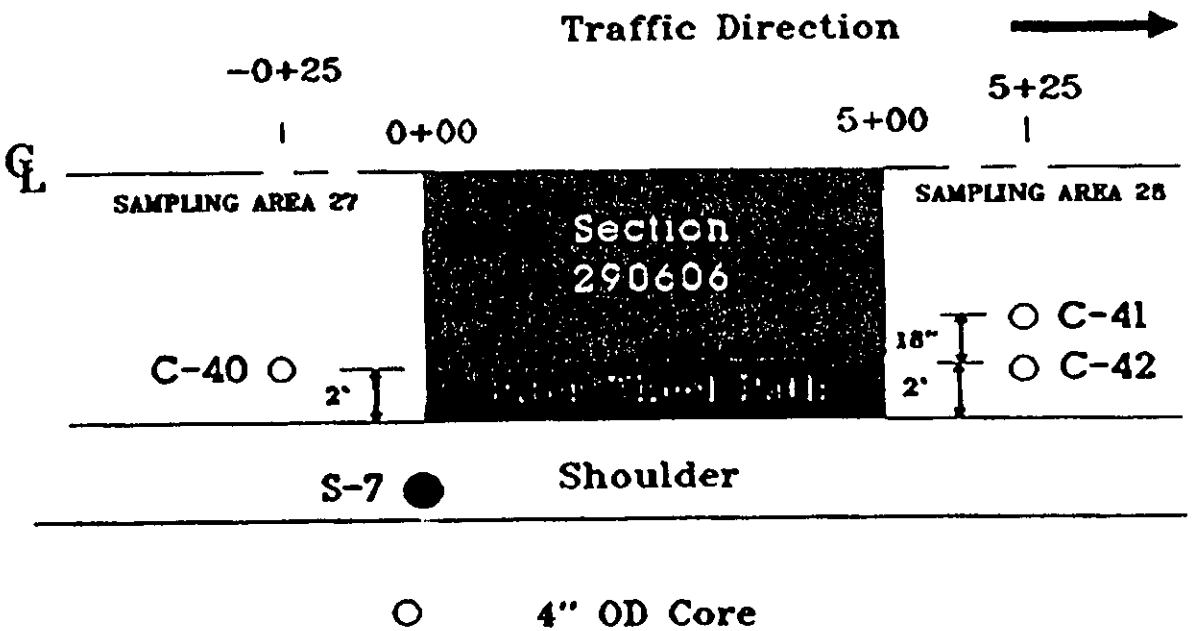


0

I-35, Harrison County

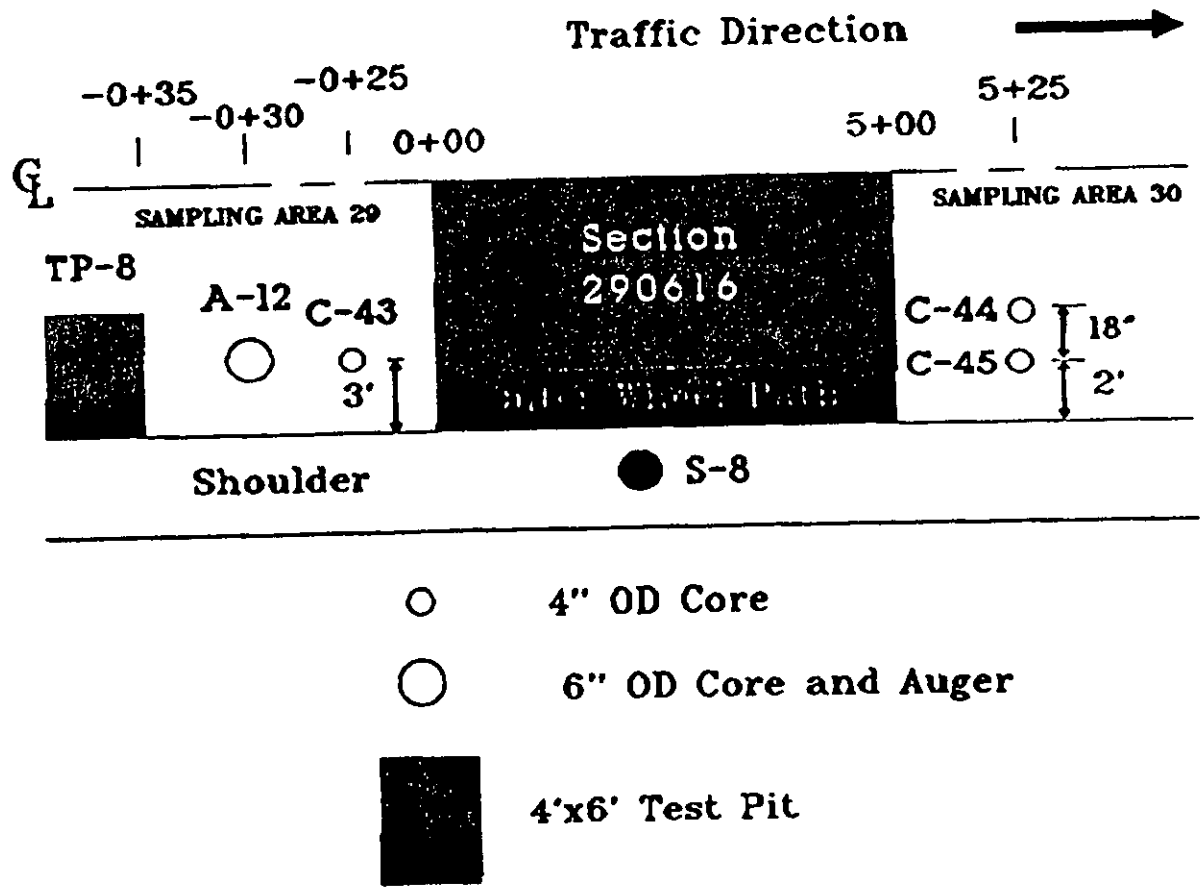
PREPARED ON 9/26/91
PAGE 13 OF 16

"Pre-Construction" Sampling Plan
Missouri SPS-6



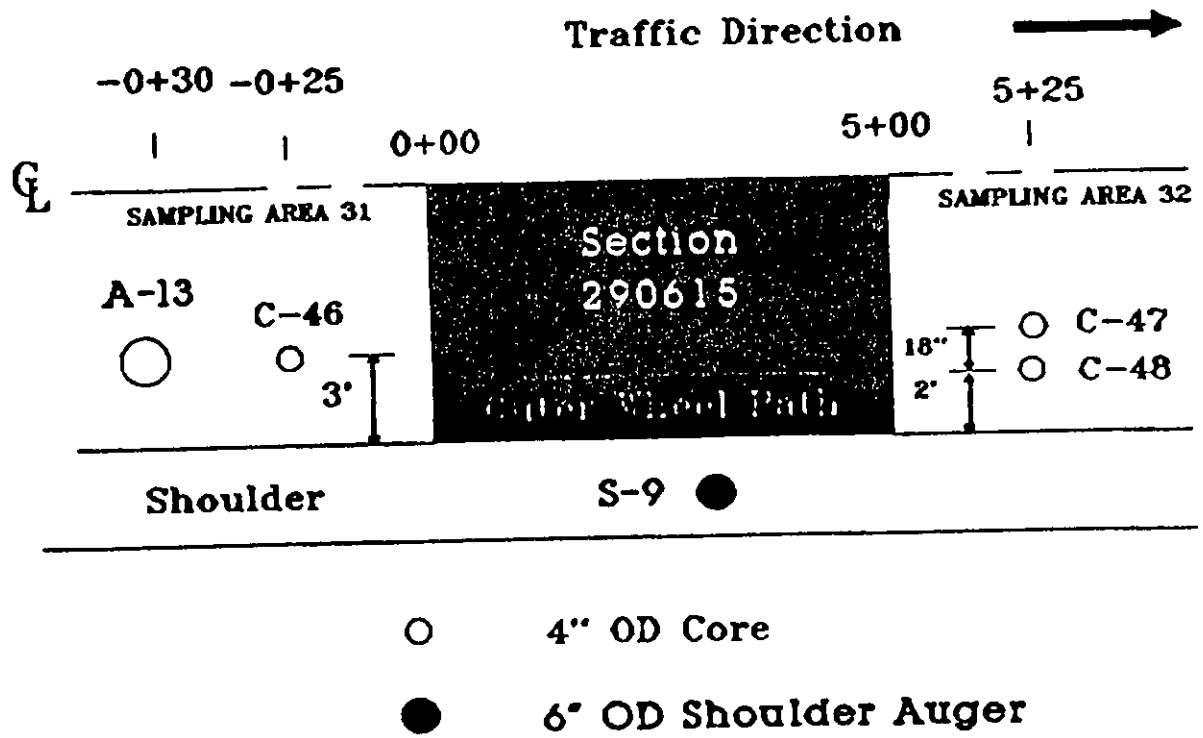
0

"Pre-Construction" Sampling Plan
Missouri SPS-6



0

"Pre-Construction" Sampling Plan
Missouri SPS-6



0

I-35, Harrison County

PREPARED ON 9/26/91
PAGE 16 OF 16

ATTACHMENT 6

PRE-CONSTRUCTION SAMPLE TESTING

PRE-CONSTRUCTION LABORATORY TESTING

	Material Type and Properties	SHRP Protocol	Who's to Test	Core Numbers
I.	PORTLAND CEMENT CONCRETE			
	Compressive Strength	P61	PHY	C2,C5,C6,C9,C10,C12,C13, C15,C18,C20,C23,C25,C27, C28,C31,C33,C34,C37,C40, C42,C43,C46,C48
	Splitting Tensile Strength	P62	PHY	C1,C3,C4,C7,C8,C11,C14, C16,C17,C19,C21,C22,C24, C26,C29,C30,C32,C35,C36, C38,C39,C41,C44,C45,C47
	PCC Coefficient of Thermal Expansion	P63	FED	A1,A2,A3,A4,A5,A6,A7,A8, A9,A10,A11,A12,A13
	Static Modulus of Elasticity	P64	RES	C2,C5,C6,C10,C13,C18,C20, C23,C25,C27,C31,C34,C37, C40,C43,C46
	PCC Unit Weight	P65	PHY	C2,C5,C6,C9,C10,C12,C13, C15,C18,C20,C23,C25,C27, C28,C31,C33,C34,C37,C40, C42,C43,C46,C48
	Core Examination / Thickness	P66	RES	C1 - C48 and A1 - A13
II.	UNBOUND GRANULAR BASE			
	Particle Size Analysis	P41	PHY	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8
	Sieve Analysis (washed)	P41	PHY	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8
	Atterberg Limits	P43	PHY	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8
	Moisture - Density Limits	P44	PHY	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8

Resilient Modulus	P46	SOILS	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8
Classification	P47	PHY	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8
Permeability	P48	SOILS	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8
Natural Moisture Content	P49	SOILS	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8
III. SUBGRADE			
Sieve Analysis (washed)	P51	PHY	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8
Hydrometer to 0.001mm	P42	PHY	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8
Atterberg Limits	P43	PHY	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8
Classification	P52	PHY	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8,A1 - A13
Moisture - Density Limits	P55	PHY	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8
Resilient Modulus	P46	SOILS	A1 - A13
Unit Weight	P56	PHY	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8, and A1 - A13
Natural Moisture Content	P49	SOILS	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8

PHY - PHYSICAL LAB
RES - RESEARCH SECTION
SOILS - SOILS AND GEOLOGY SECTION

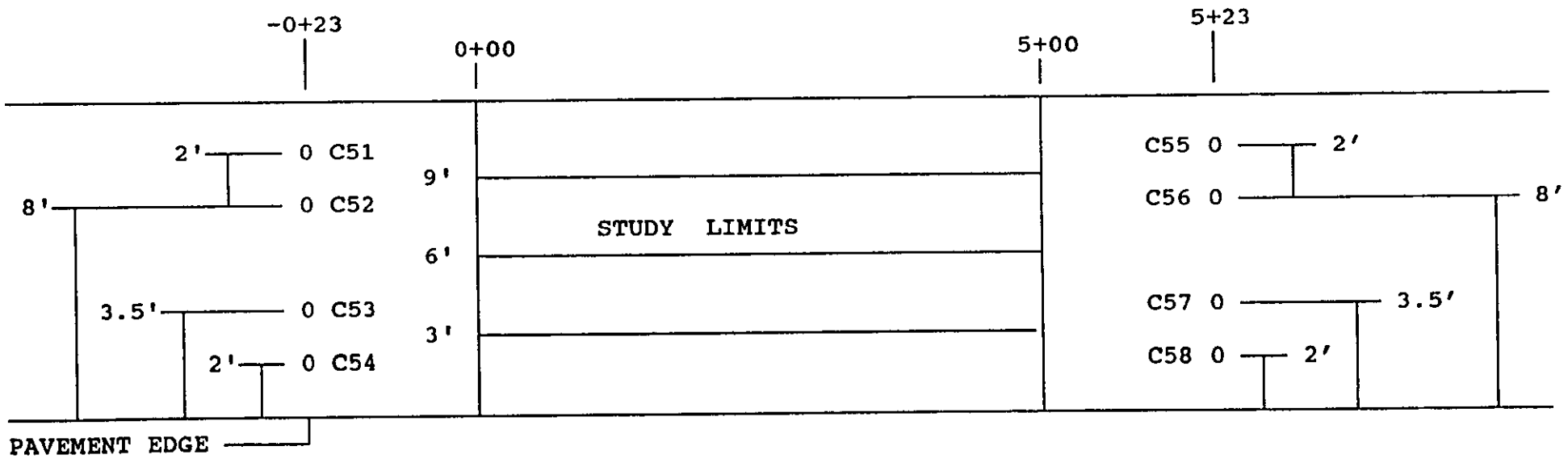
ATTACHMENT 7

CONSTRUCTION SAMPLES AND TESTS

TEST SECTION CONSTRUCTION SAMPLING

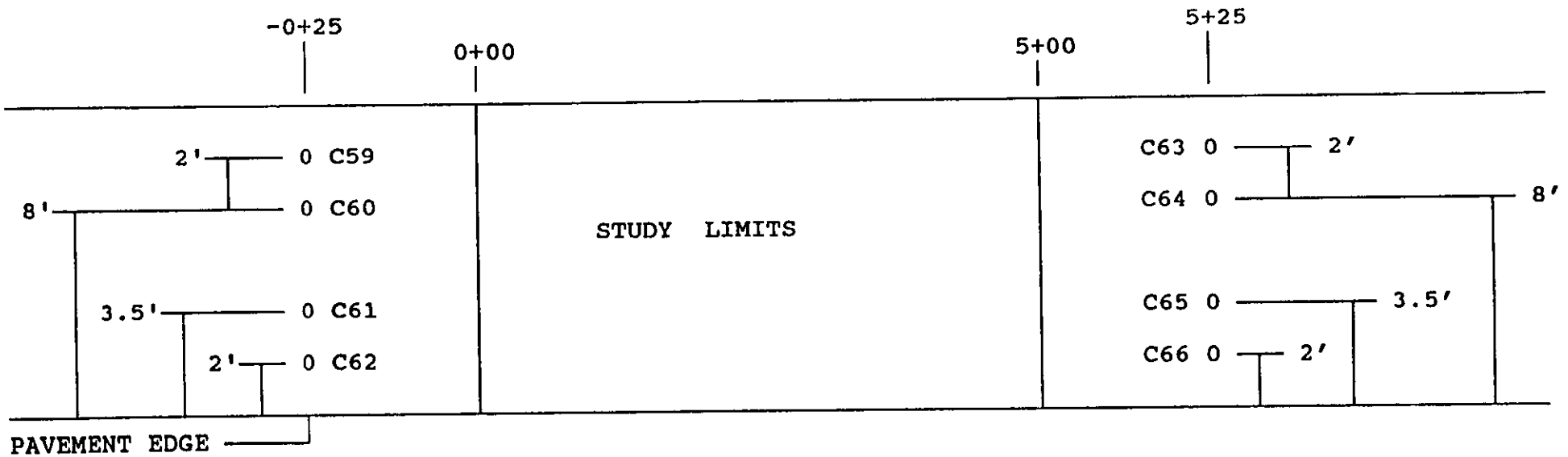
TEST SECTION NUMBER 290607

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290607

B. SAMPLE PLAN FOR IC LIFT



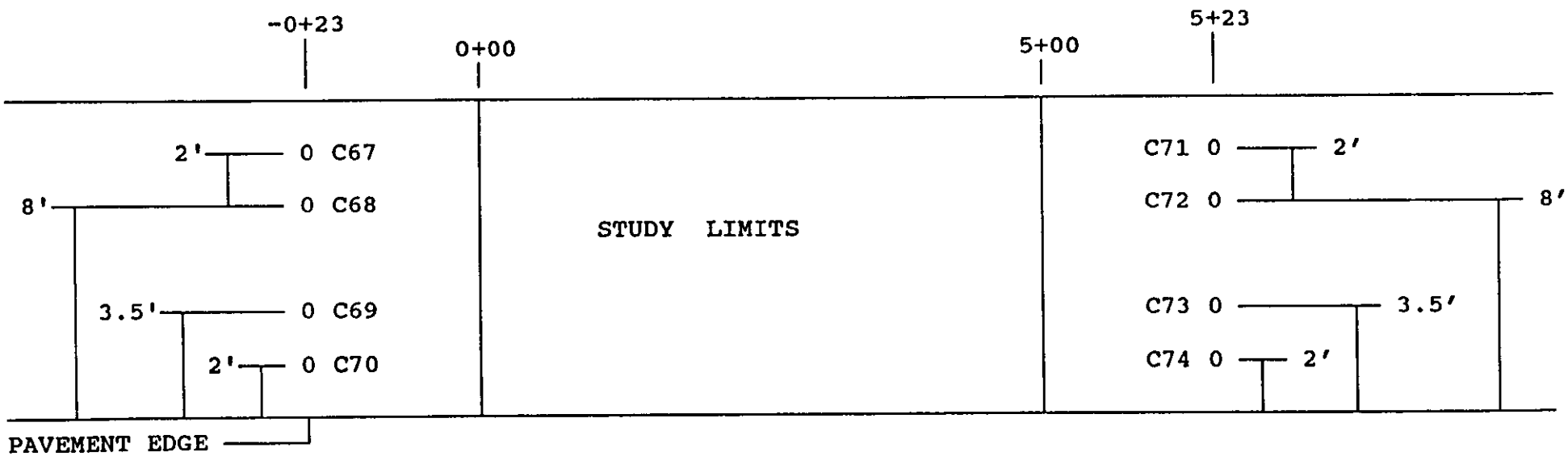
Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3'	-	430 , 170 , & 335
6'	-	175 , 240 , & 380
9'	-	400 ,475 , & 450

TEST SECTION CONSTRUCTION SAMPLING

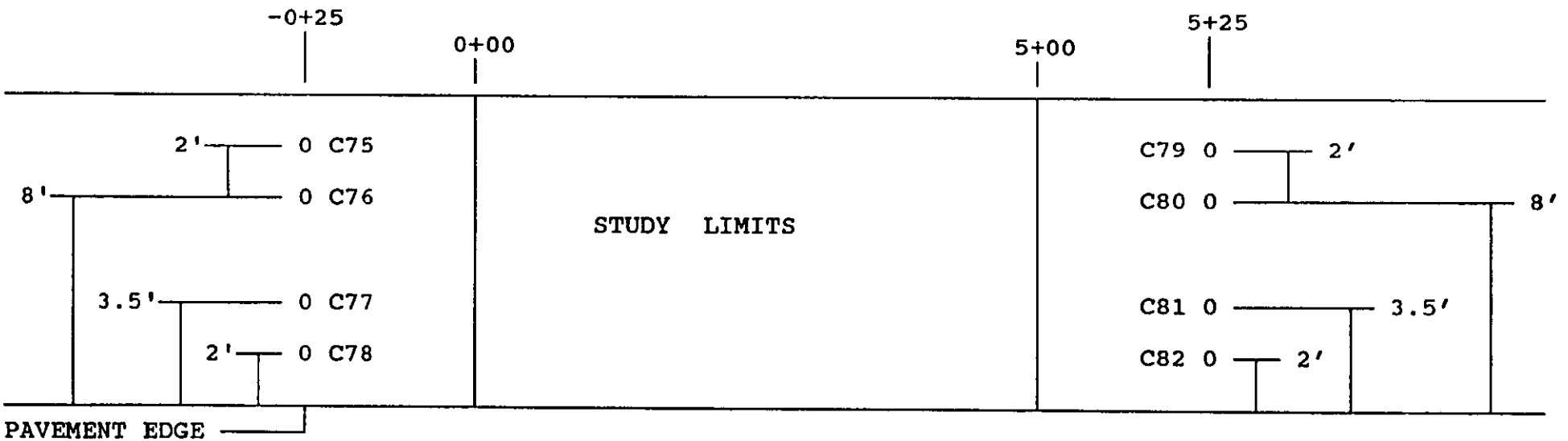
TEST SECTION NUMBER 290609

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290609

B. SAMPLE PLAN FOR IC LIFT



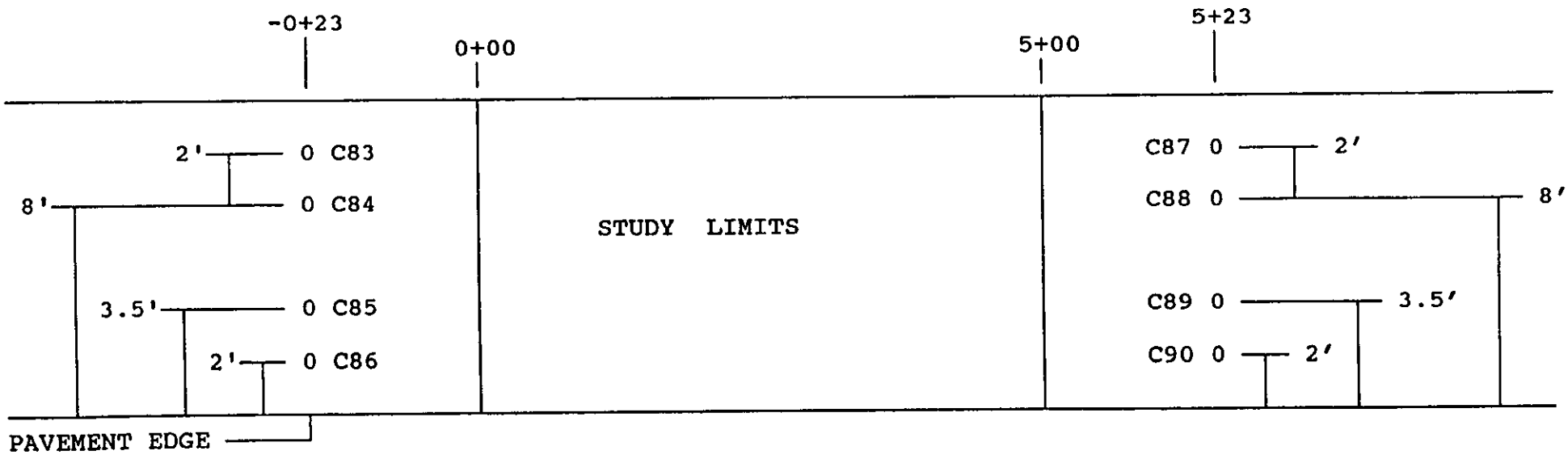
Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y Coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3′	-	100 , 240 , & 25
6′	-	320 , 445 , & 235
9′	-	210 , 480 , & 120

TEST SECTION CONSTRUCTION SAMPLING

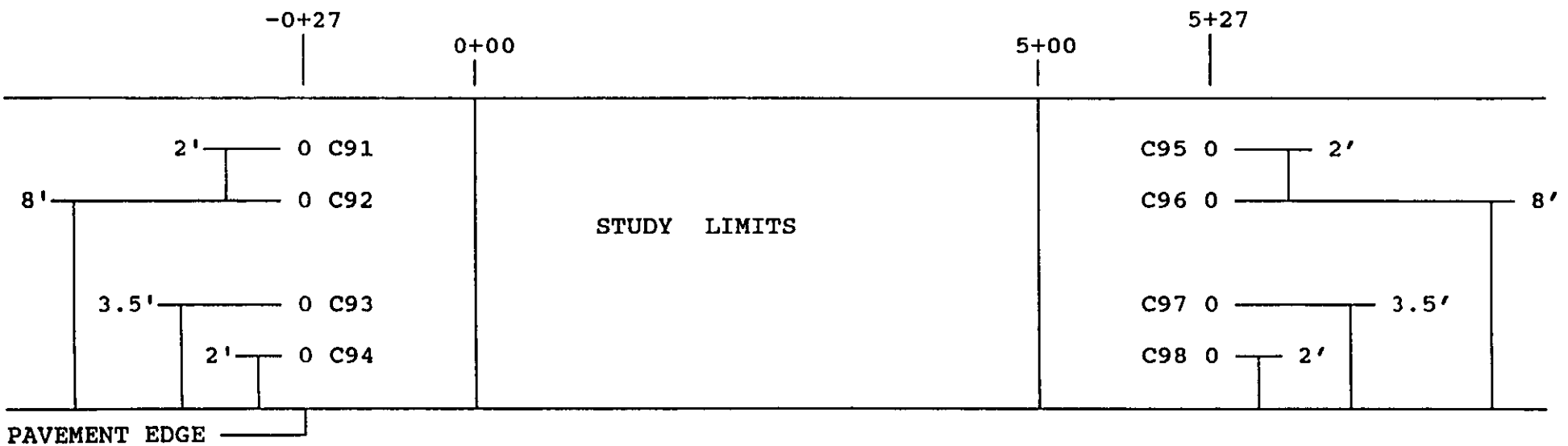
TEST SECTION NUMBER 290610

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290610

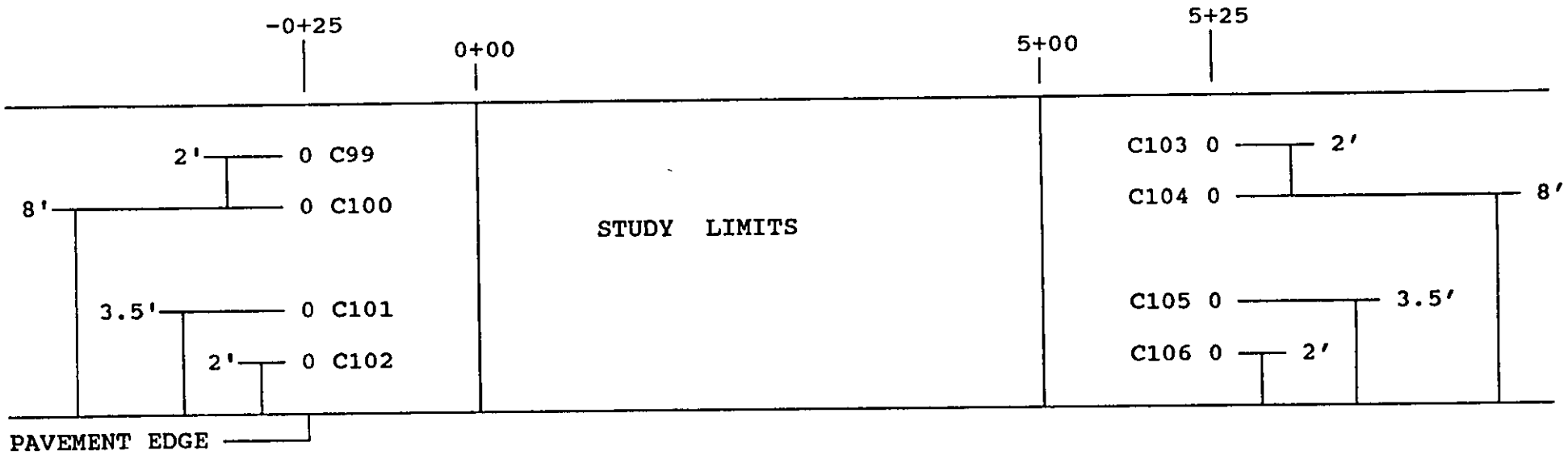
B. <u>SAMPLE PLAN FOR SECOND IB LIFT</u>



NOTE: If a third lift of I-B is used cores will be at 29 and 5+29 and numbered as on thispage with a A suffix.

TEST SECTION NUMBER 290610

C. SAMPLE PLAN FOR IC LIFT



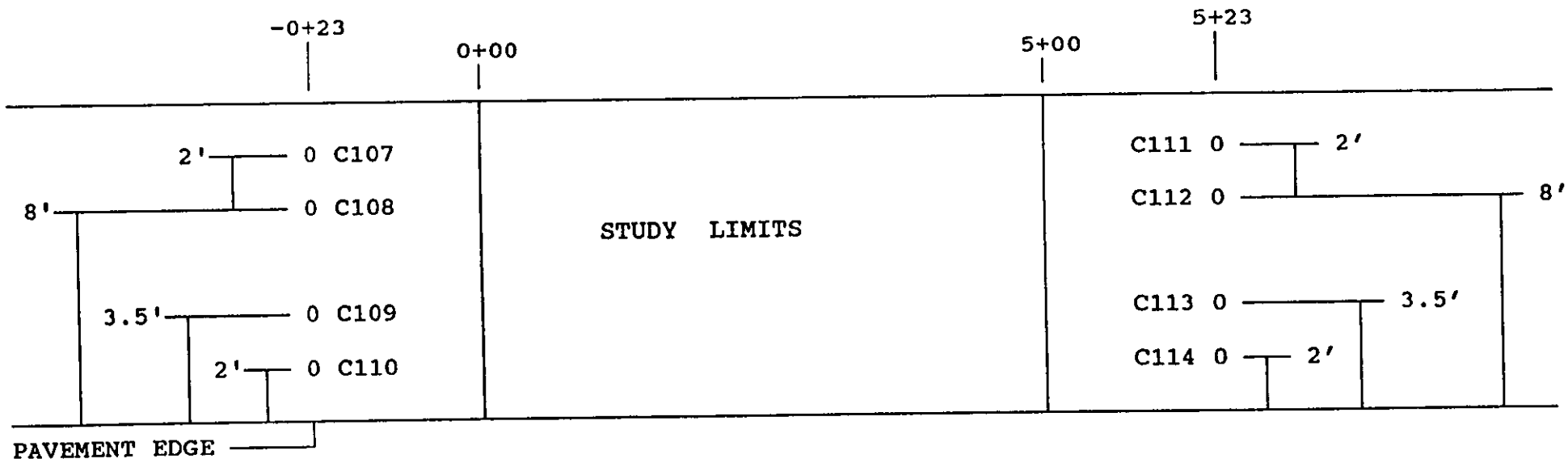
Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y Coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3'	-	265 , 195 , & 320
6'	-	250 , 265 , & 15
9'	-	115 , 100 , & 450

TEST SECTION CONSTRUCTION SAMPLING

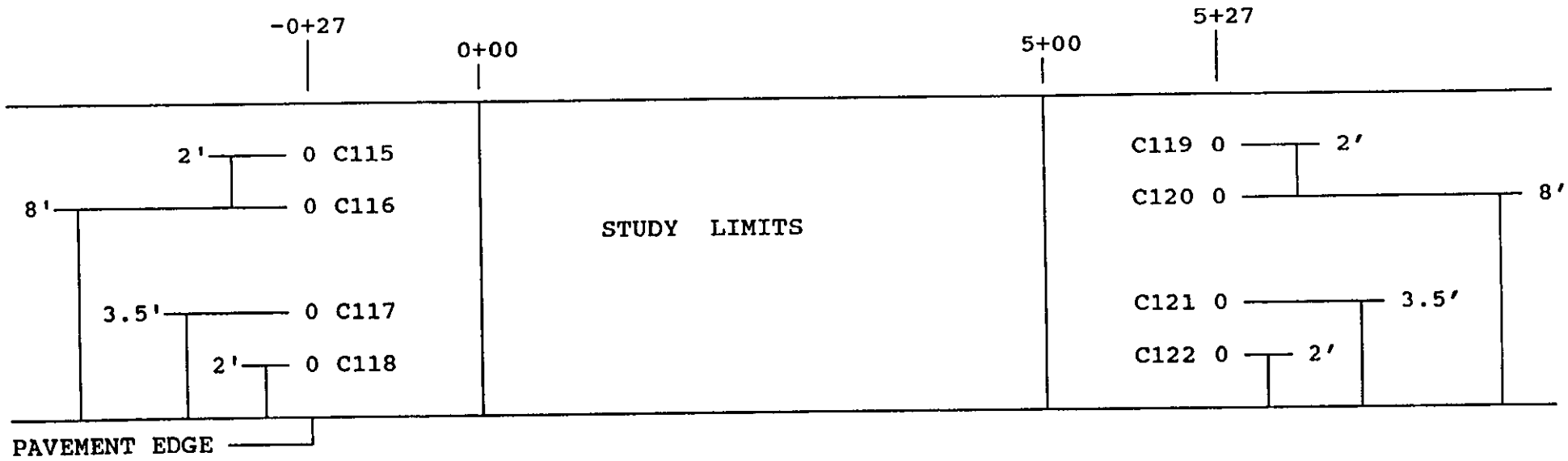
TEST SECTION NUMBER 290608

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290608

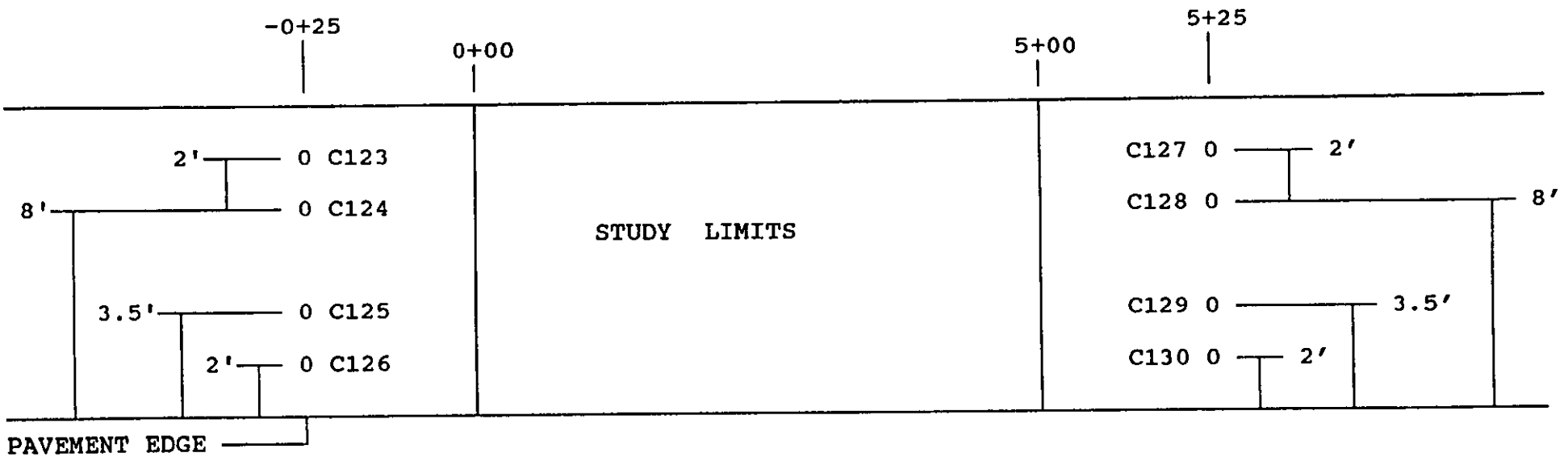
B. SAMPLE PLAN FOR SECOND IB LIFT



NOTE: If a third lift of I-B is used cores will be at 29 and 5+29 and numbered as on thispage with a A suffix.

TEST SECTION NUMBER 290608

C. SAMPLE PLAN FOR IC LIFT



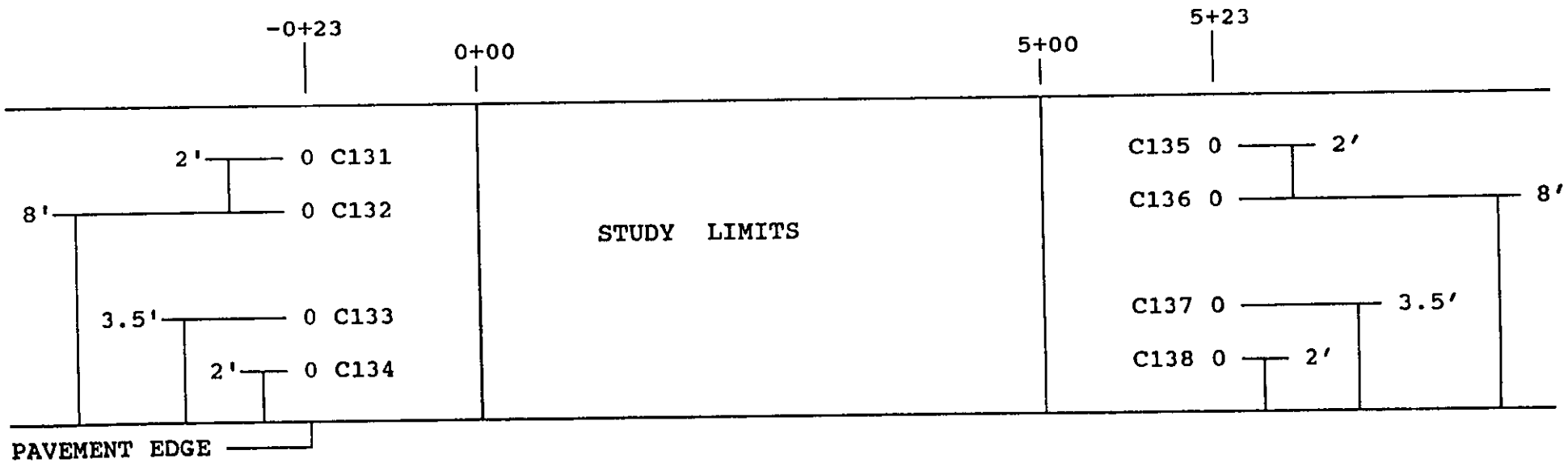
Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y Coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3'	-	185 , 335 , & 35
6'	-	75 , 190 , & 155
9'	-	80 , 55 , & 325

TEST SECTION CONSTRUCTION SAMPLING

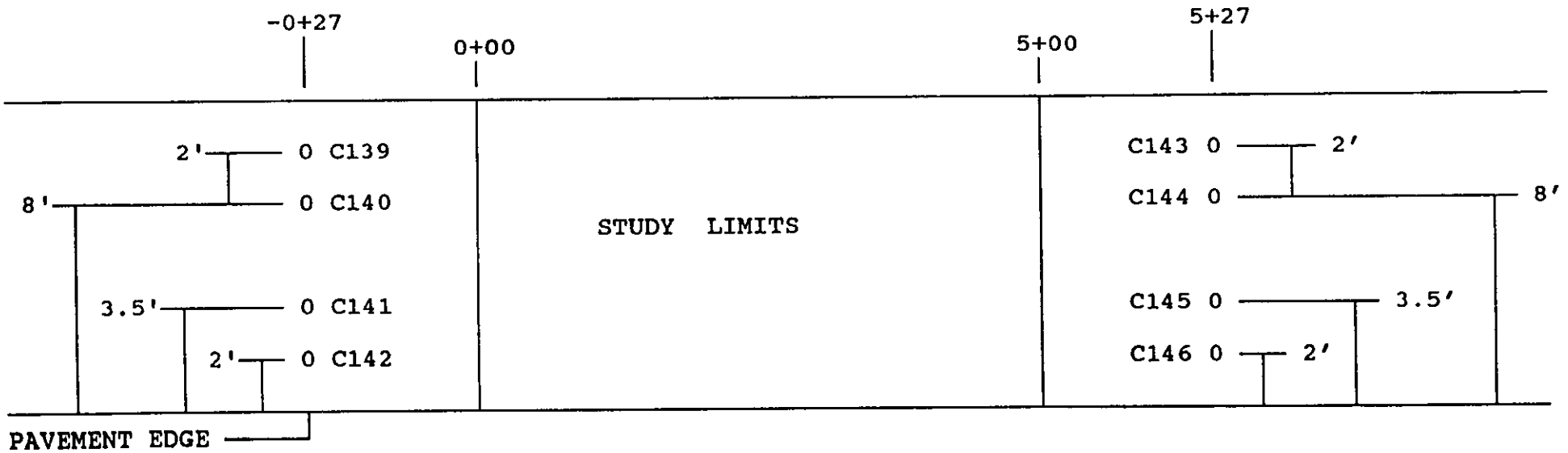
TEST SECTION NUMBER 290612

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290612

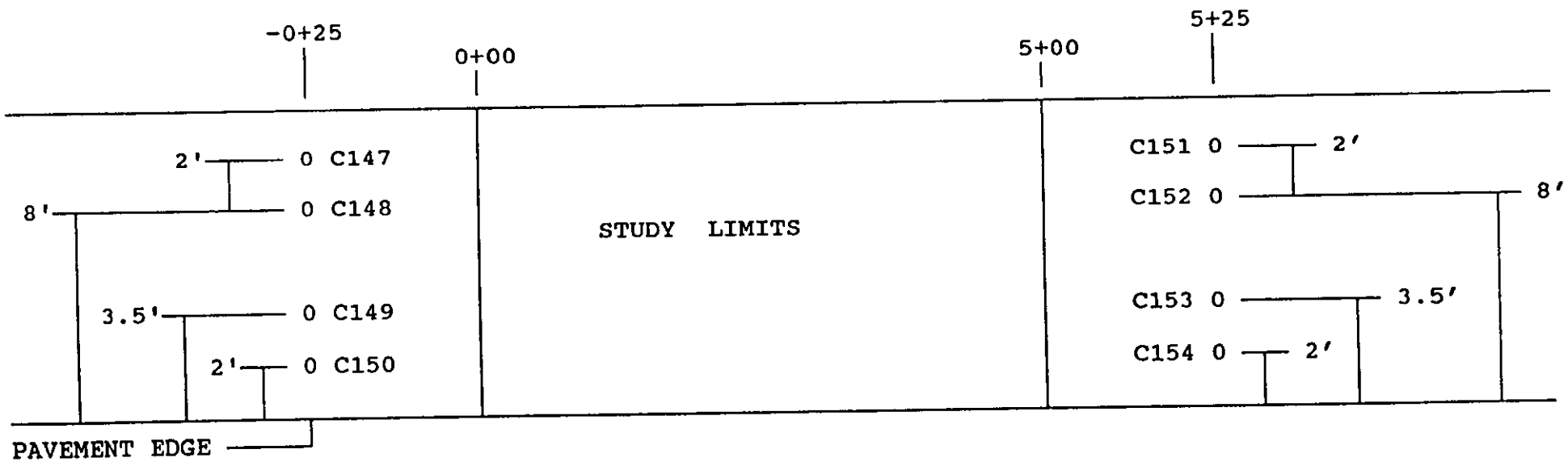
B. <u>SAMPLE PLAN FOR SECOND IB LIFT</u>



NOTE: If a third lift of I-B is used cores will be at 29 and 5+29 and numbered as on thispage with a A suffix.

TEST SECTION NUMBER 290612

C. SAMPLE PLAN FOR IC LIFT



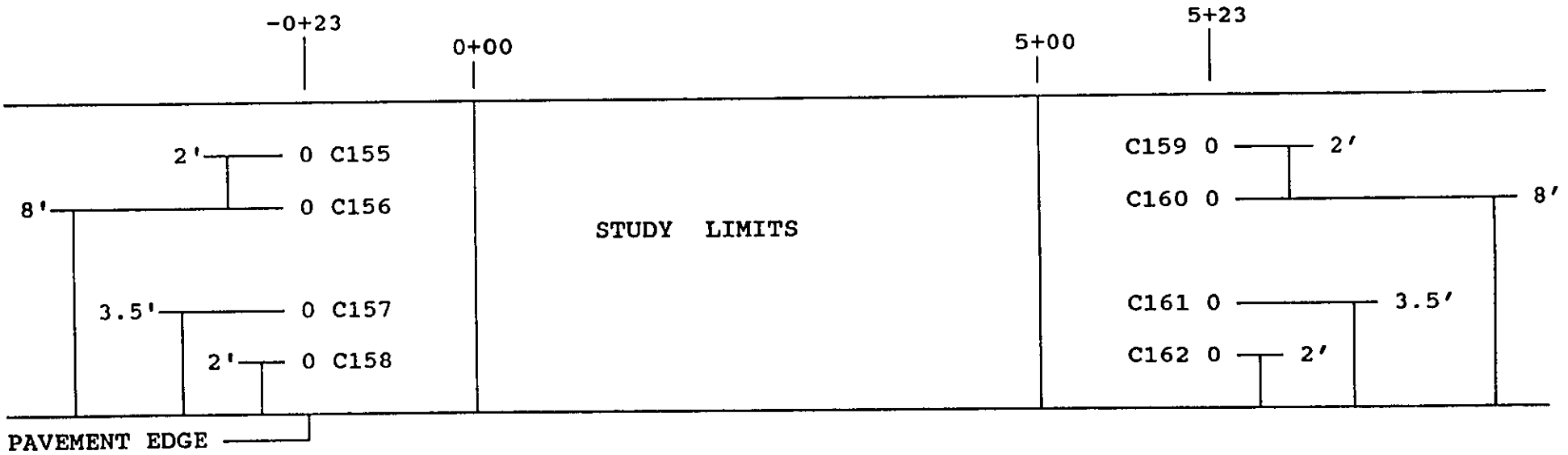
Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y Coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3'	-	235 , 320 , & 15
6'	-	115 , 330 , & 265
9'	-	490 , 475 , & 55

TEST SECTION CONSTRUCTION SAMPLING

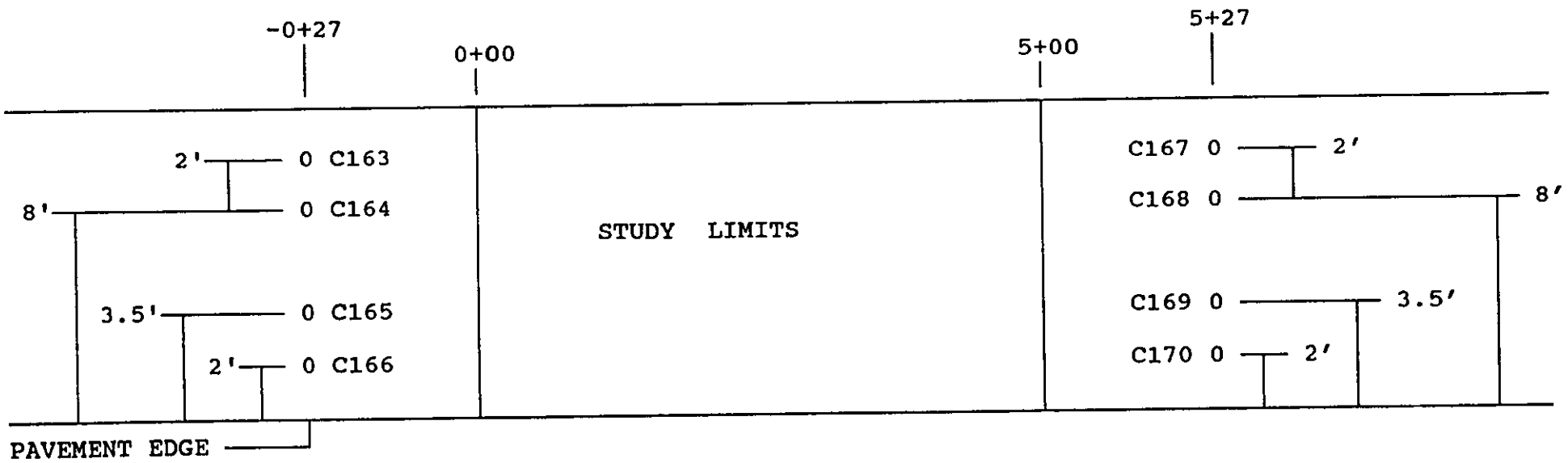
TEST SECTION NUMBER 290614

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290614

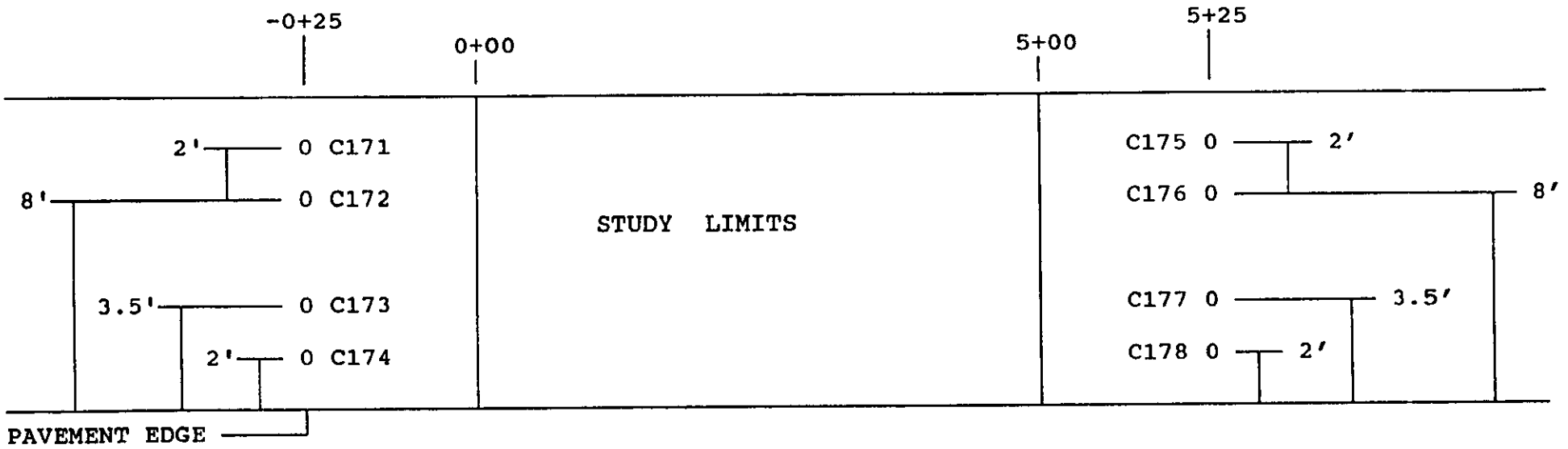
B. SAMPLE PLAN FOR SECOND IB LIFT



NOTE: If a third lift of I-B is used cores will be at 29 and 5+29 and numbered as on thispage with a A suffix.

TEST SECTION NUMBER 290614

C. SAMPLE PLAN FOR IC LIFT



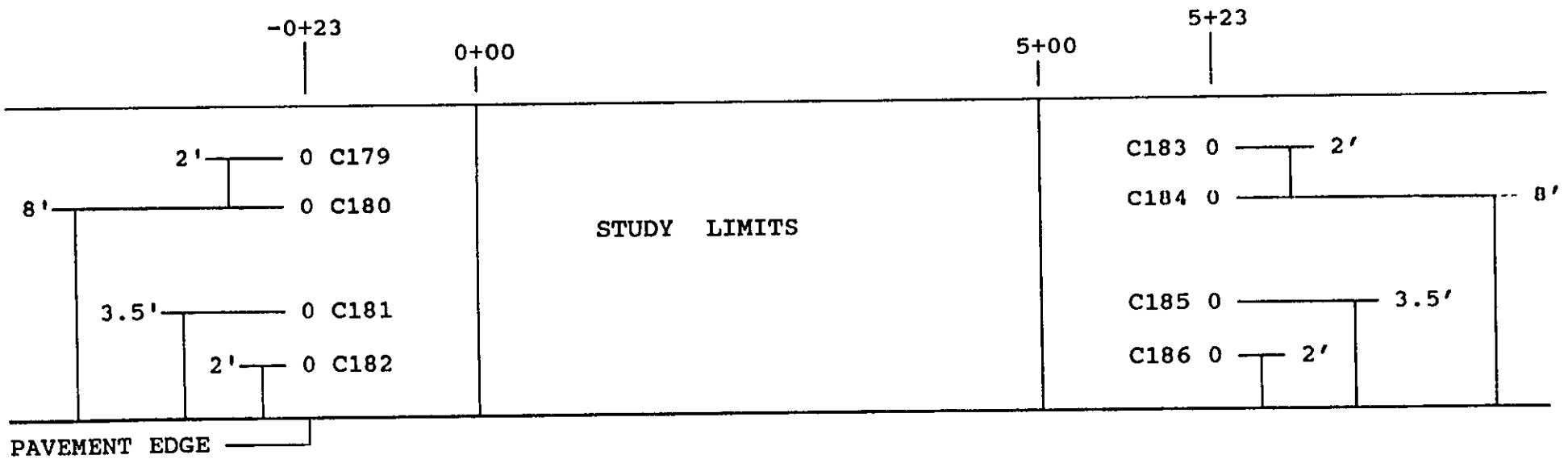
Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y Coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3'	-	365 , 305 , & 350
6'	-	325 , 405 , & 165
9'	-	490 , 440 , & 55

TEST SECTION CONSTRUCTION SAMPLING

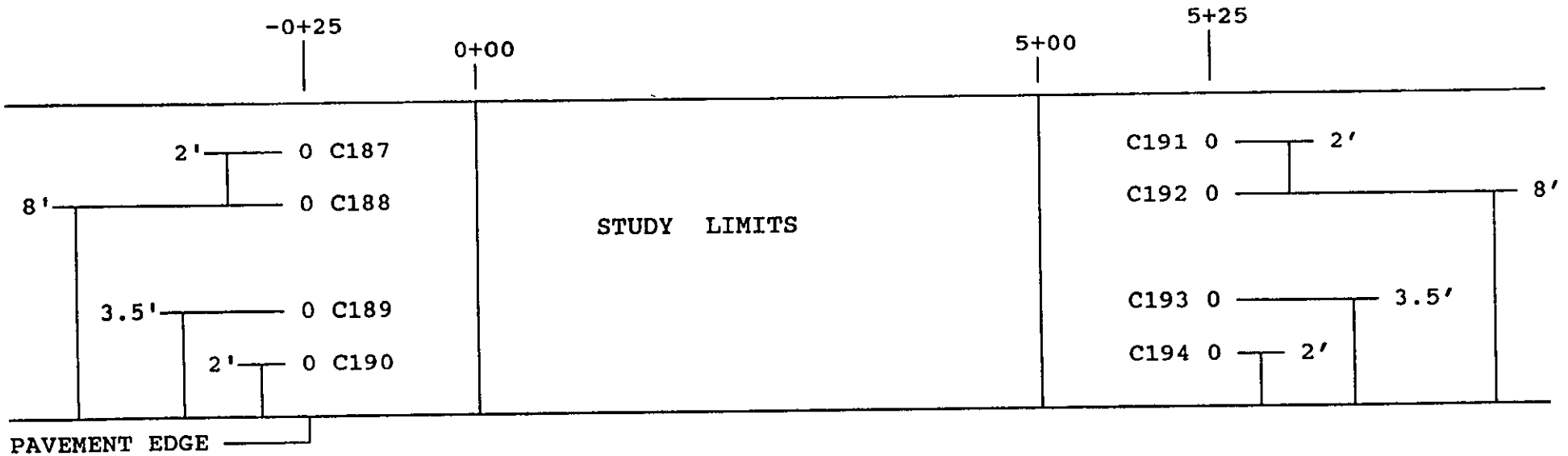
TEST SECTION NUMBER 290613

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290613

B. SAMPLE PLAN FOR IC LIFT



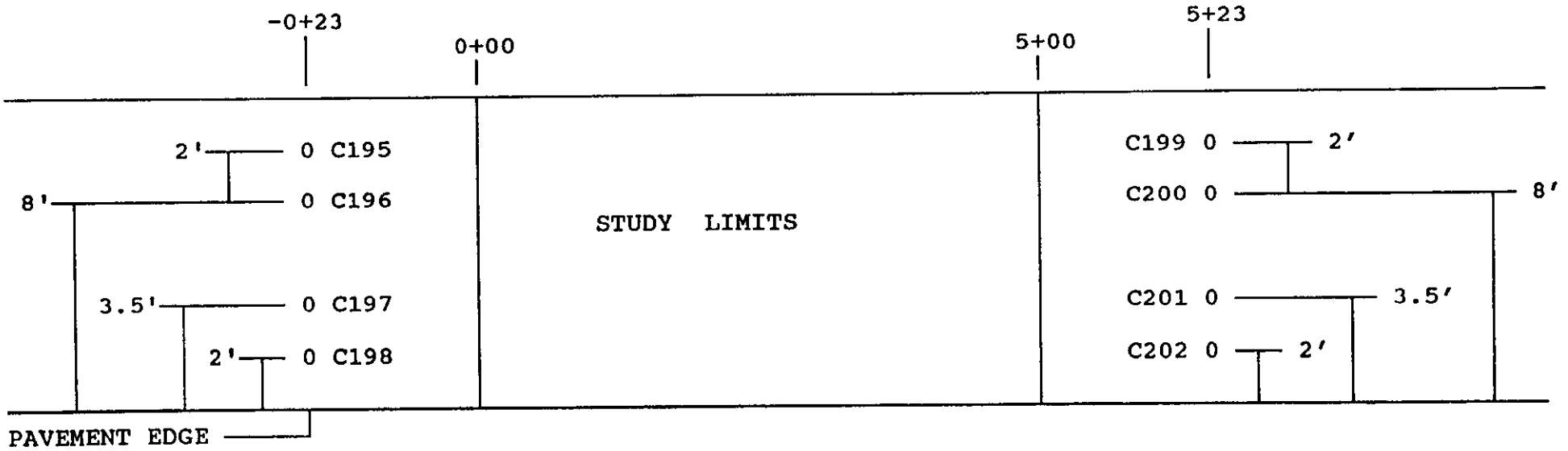
Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y Coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3'	-	225 , 285 , & 90
6'	-	120 , 30 , & 175
9'	-	150 , 170 , & 130

TEST SECTION CONSTRUCTION SAMPLING

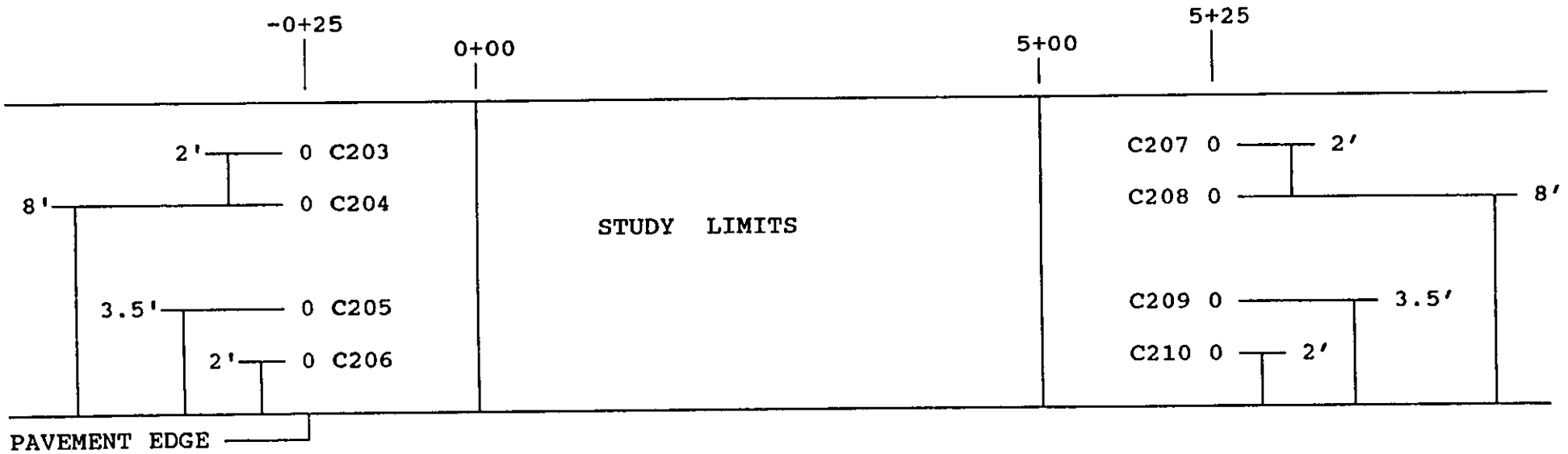
TEST SECTION NUMBER 290611

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290611

B. SAMPLE PLAN FOR IC LIFT



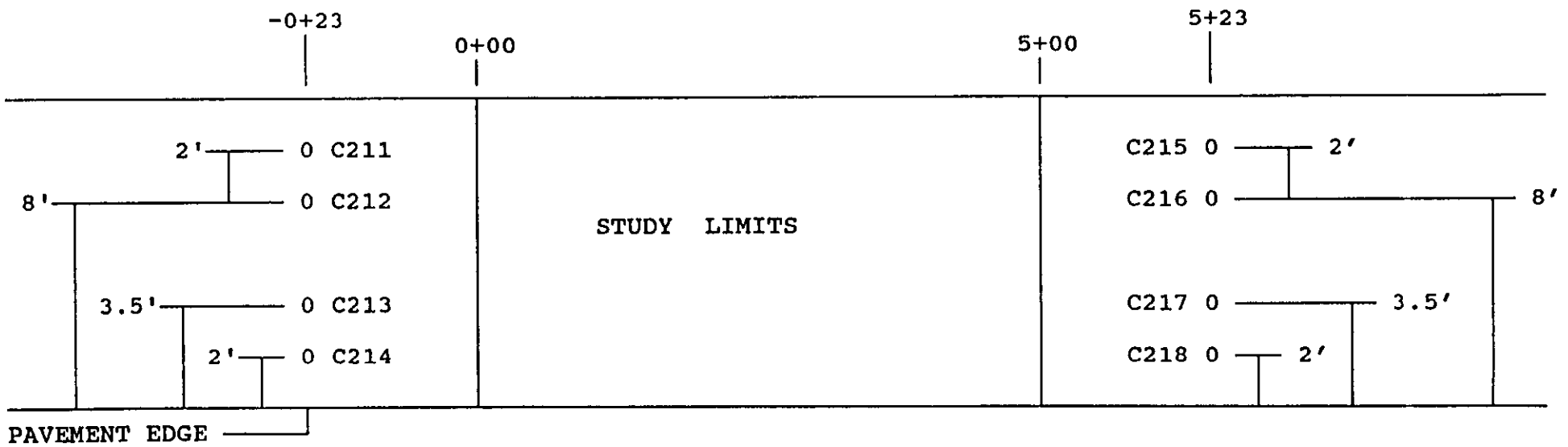
Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y Coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3'	-	485 , 160 , & 425
6'	-	130 , 485 , & 380
9'	-	10 , 25 , & 80

TEST SECTION CONSTRUCTION SAMPLING

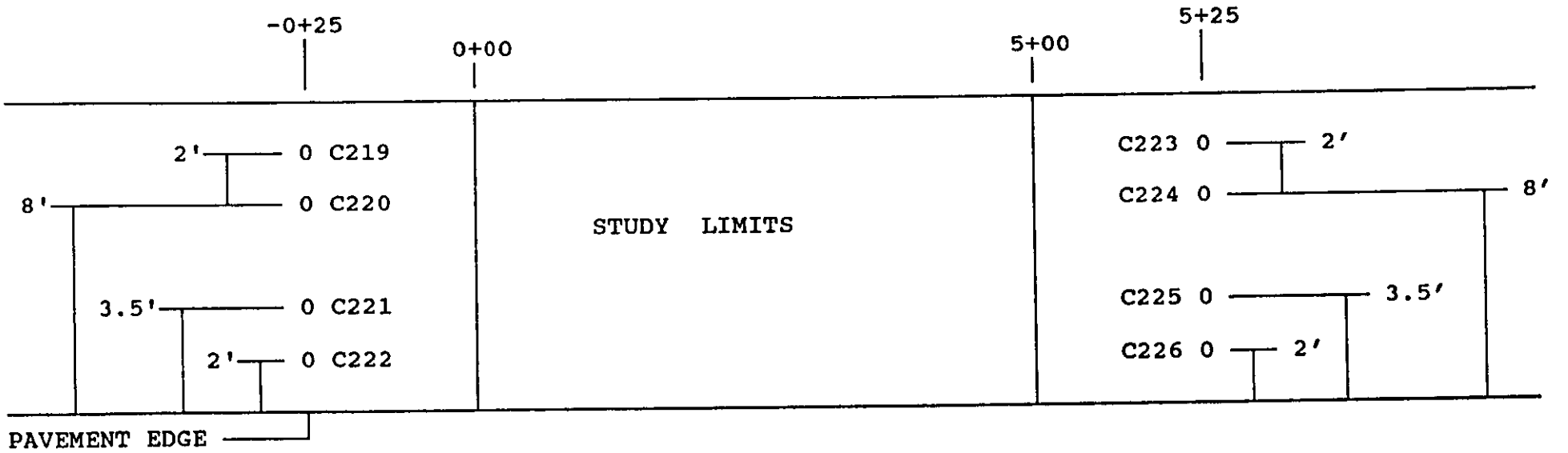
TEST SECTION NUMBER 290604

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290604

B. SAMPLE PLAN FOR IC LIFT



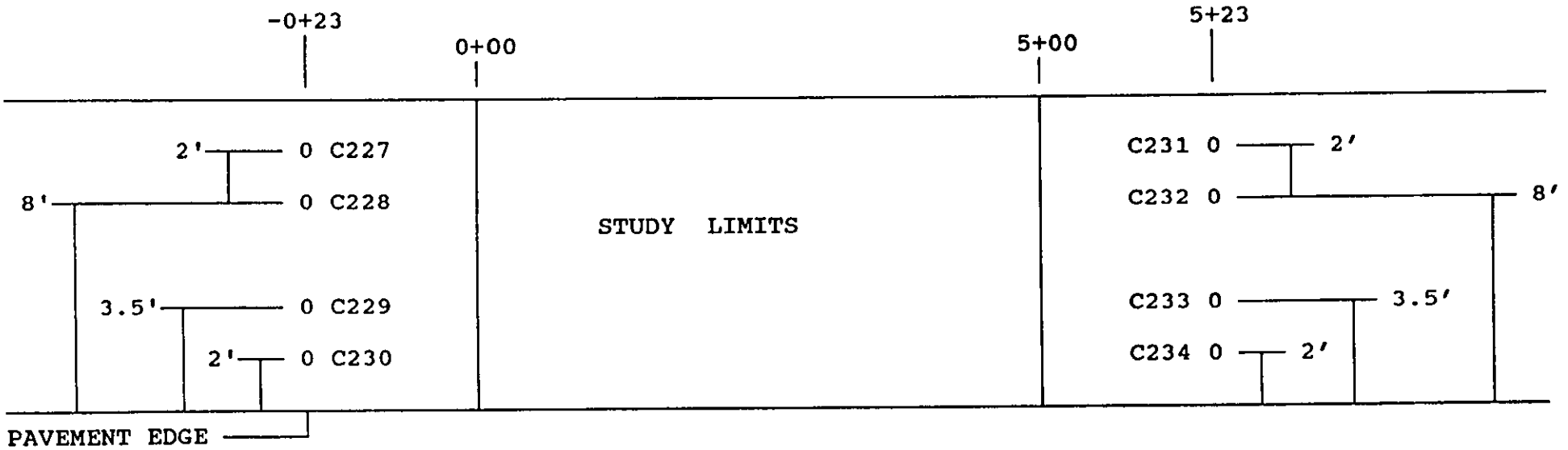
Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y Coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3'	-	190 , 260 , & 235
6'	-	90 , 310 , & 190
9'	-	425 , 395 , & 315

TEST SECTION CONSTRUCTION SAMPLING

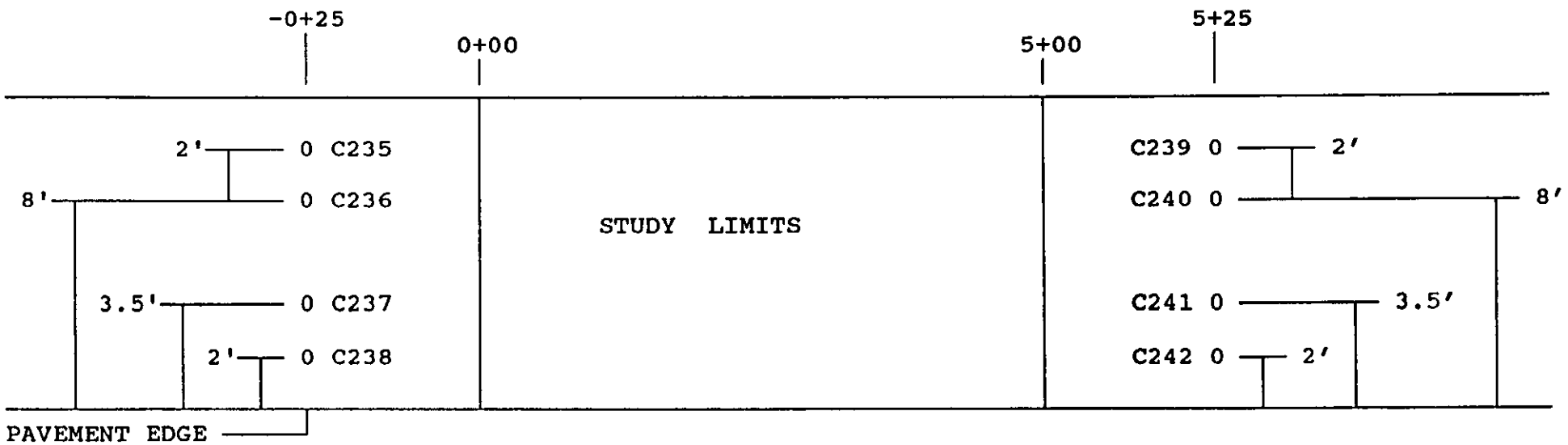
TEST SECTION NUMBER 290603

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290603

B. SAMPLE PLAN FOR IC LIFT



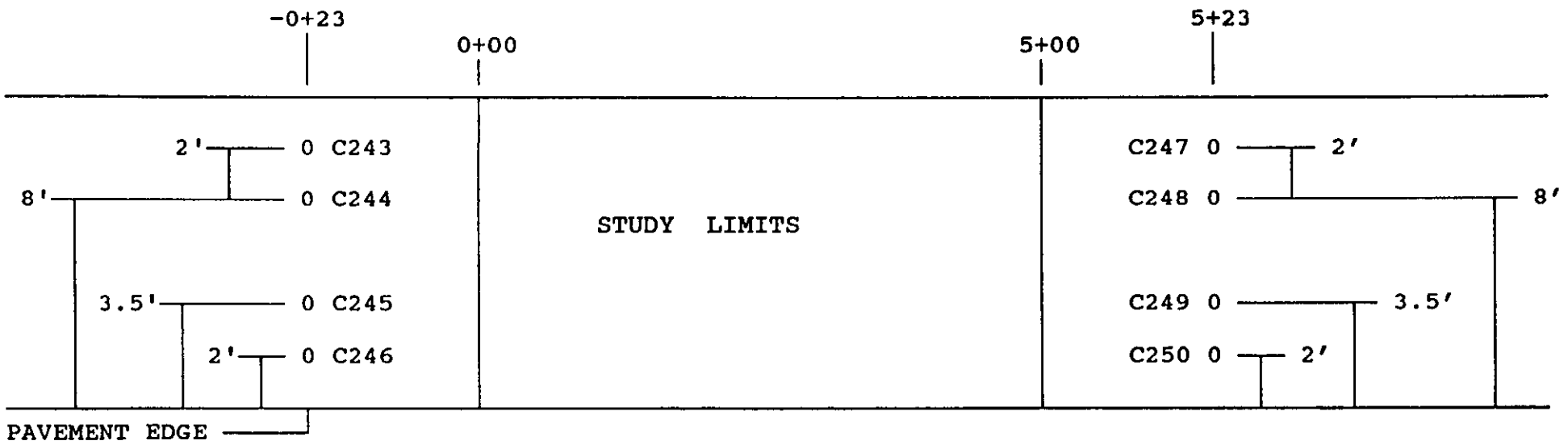
Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y Coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3'	-	450 , 260 , & 160
6'	-	360 , 440 , & 140
9'	-	230 , 410 , & 435

TEST SECTION CONSTRUCTION SAMPLING

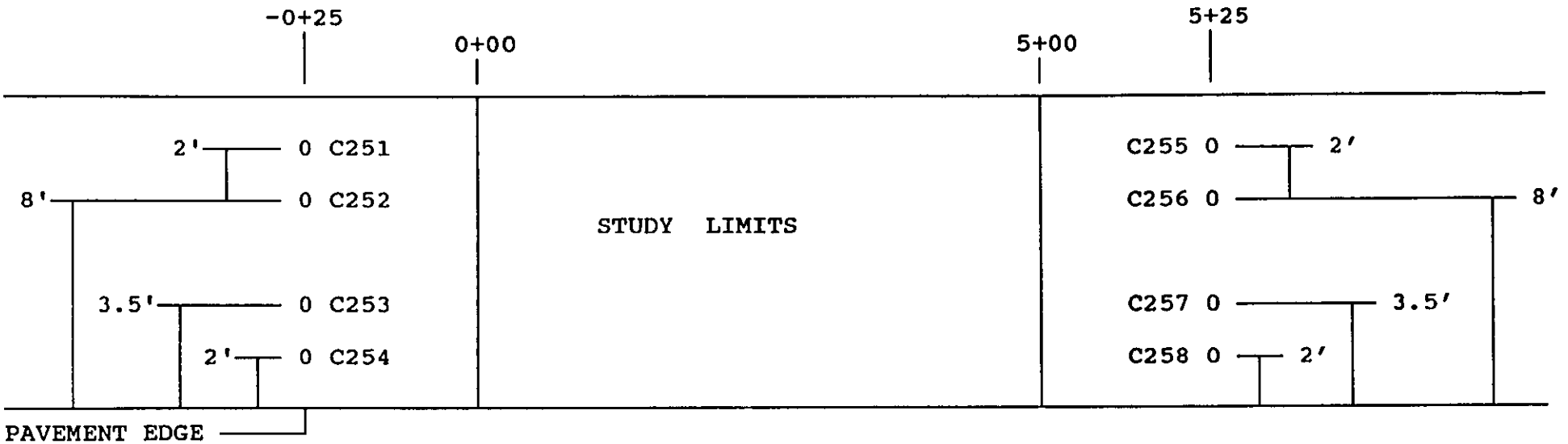
TEST SECTION NUMBER 290606

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290606

B. SAMPLE PLAN FOR IC LIFT



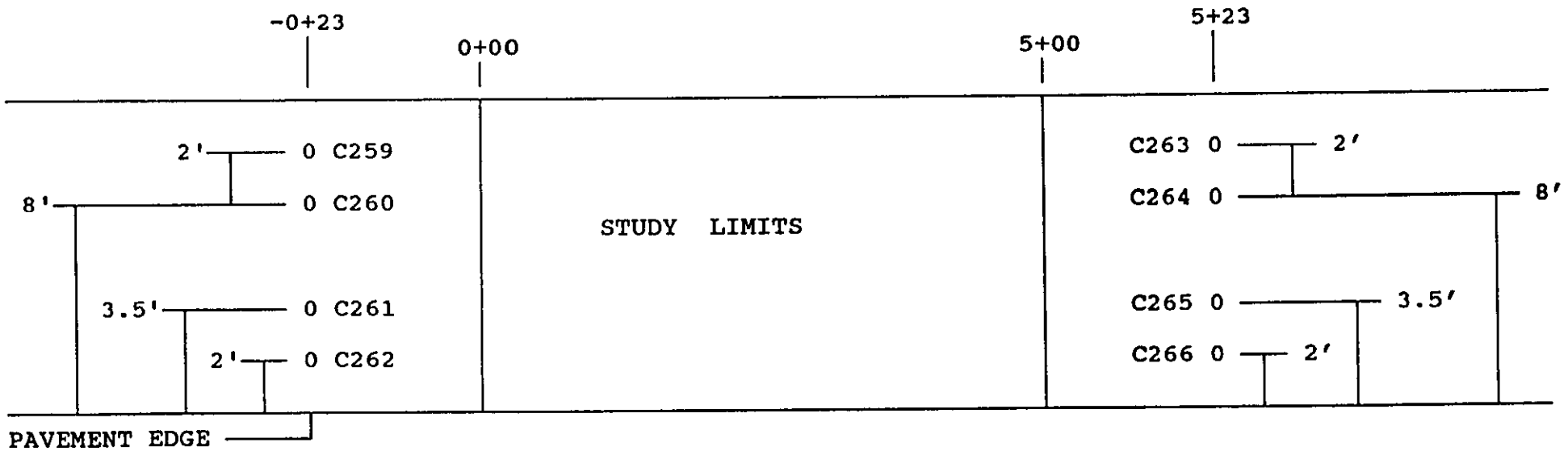
Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y Coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3'	-	285 , 265 , & 15
6'	-	260 , 480 , & 235
9'	-	390 , 175 , & 400

TEST SECTION CONSTRUCTION SAMPLING

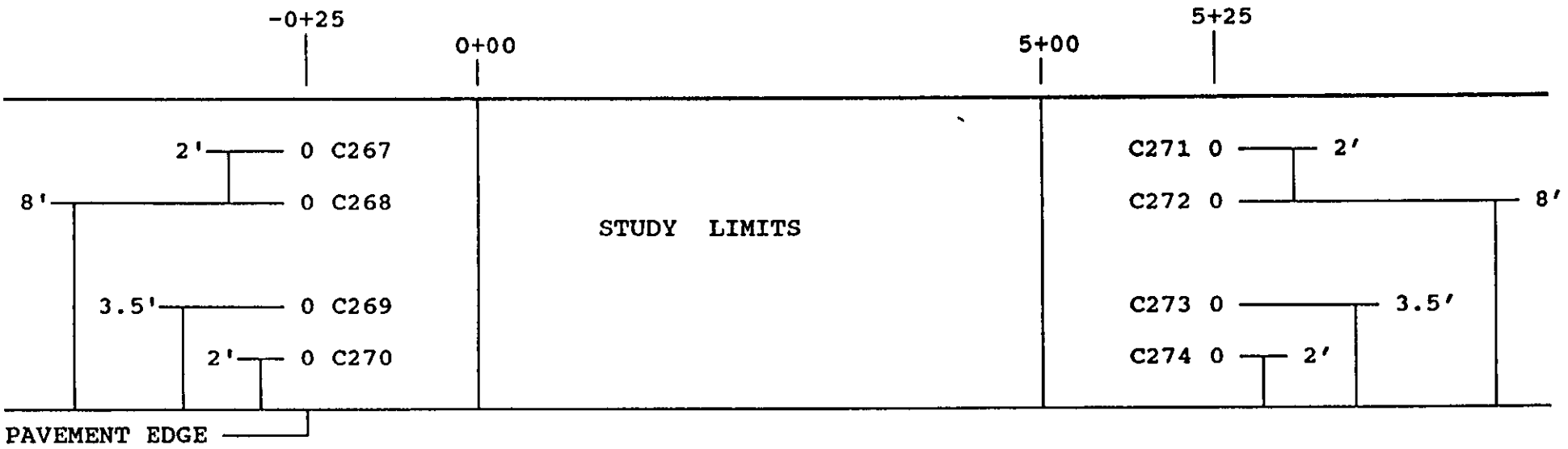
TEST SECTION NUMBER 290615

A. SAMPLE PLAN FOR FIRST IB LIFT



TEST SECTION NUMBER 290615

B. SAMPLE PLAN FOR IC LIFT



Nuclear Density test locations - Tests will be run at the C core locations and at the following X-Y Coordinates. 0+00 and the right pavement edge will be the 0,0 coordinate.

Transverse		Longitudinal
3'	-	135 , 190 , & 220
6'	-	175 , 490 , & 260
9'	-	5 , 385 , & 335

POST-CONSTRUCTION LABORATORY TESTING

Material Type and Properties	SHRP Protocol	Who's to Test	Core or Sample Numbers
I. ASPHALT CONCRETE			
Core Examination / Thickness	P01	RES	All Cores
Bulk Specific Gravity	P02	PHY	All Cores
Maximum Specific Gravity	P03	PHY	To be Determined
Asphalt Content (Extraction)	P04	CHEM	To be Determined
Moisture Susceptibility	P05	PHY	To be Determined
Creep Compliance	P06	PHY	To be Determined (from Cores)
Resilient Modulus	P07	PHY	To be Determined (from Cores)
Tensile Strength	P07	PHY	To be Determined (from Cores)
II. EXTRACTED AGGREGATE			
Bulk Specific Gravity			
Coarse Aggregate	P11	PHY	To be Determined
Fine Aggregate	P12	PHY	To be Determined
Type and Classification			
Coarse Aggregate	P13	PHY	To be Determined
Fine Aggregate	P13	PHY	To be Determined
Gradation of Aggregate	P14	PHY PHY	To be Determined

Roundness Index of Coarse Aggregate	P14B	PHY	To be Determined
NAA Test For Fine Aggregate Particle Shape	P14A	PHY	To be Determined

III. ASPHALT CEMENT (FROM MIX)

Abson Recovery	P21	CHEM	To be Determined
Penetration at 50F, 77F, 90F	P22	CHEM	To be Determined
Specific Gravity (60F)	P23	CHEM	To be Determined
Viscosity at 77F	P24	CHEM	To be Determined
Viscosity at 140F,275F	P25	CHEM	To be Determined

PHY - PHYSICAL LAB
CHEM - CHEMICAL LAB
RES - RESEARCH SECTION