

SPS-1  
Michigan (26)

**AS-SAMPLED  
SAMPLING AND TESTING PLAN  
SPS-1 EXPERIMENTAL PROJECT  
US-27 SOUTHBOUND  
CLINTON COUNTY, MICHIGAN**

Strategic Highway Research Program  
Long Term Pavement Performance  
Specific Pavement Studies

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## **1.0 INTRODUCTION**

The SHRP experimental project SPS-1, "Strategic Study of Structural Factors for Flexible Pavements", investigates the effect of selected structural factors on the long term performance of flexible pavements. The structural factors considered include surface layer thickness, base type (material), drainability (permeability), and base course thickness. In this experiment, twelve test sections are constructed. Field tests are conducted and samples obtained at the twelve test sections at different stages of construction. The purpose of the sampling and testing activities is to document the conditions of the as-built pavement layers. The sampling and testing at each section is conducted on the outer lane (right lane).

A SPS-1 experiment is planned for construction on Southbound US-27 in Clinton County, Michigan. The Michigan SPS-1 site incorporates twelve test sections and a control section. The control section consists of the normal Michigan Department of Transportation (MDOT) pavement structure proposed for use on the remaining portion of the project outside the limits of the SPS-1 experiment. The control section will provide a comparison between the performance of sections designed according to current MDOT design practices with the SHRP sections. Sampling and field testing shall also be performed at different stages of construction in the control section.

This document presents the type, number, and locations for the sampling and testing activities at different stages of construction on all thirteen sections. In addition it contains details of the laboratory tests to be conducted on the samples. Further details of the SPS-1 experiment, material sampling procedures and laboratory testing procedures are given in References 1 through 5.

The laboratory tests shall be performed by the MDOT laboratory or their designee and the FHWA-LTPP Laboratory Materials Testing Contractor. In this document, the twelve test sections constructed according to SHRP guidelines shall be referred to as SHRP sections, while the test section constructed according to MDOT guidelines shall be referred to as the control section.

## **2.0 LAYOUT OF TEST SECTIONS**

The layout of the thirteen test sections included in the SPS-1 experimental project is shown in Fig. 1. Each test section shown in this figure is 600 feet long. Table 1 gives the

section limits for all test sections. Although each test section is 600 feet long, the monitoring portion of each section is only 500 feet, with a 50 feet length at each end being used for sampling and testing. The pavement layer materials and thicknesses for all sections are shown in Table 2.

### **3.0 MATERIALS SAMPLING AND TESTING**

Material sampling and field testing are required at different stages of construction. These activities shall be conducted according to the standards specified or referenced in this document. The standards may be specific to the SHRP-LTPP program or standard AASHTO/ASTM methods. LTPP sampling and field testing procedures have been developed specifically for the SHRP program and are described in Reference 2. In addition, protocols have been developed by SHRP for conducting laboratory tests. These protocols are documented in Appendix E.2 of the SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (Ref. 1).

In this SPS experiment, all SHRP sections are built on an embankment. The thickness of the embankment varies within each SHRP section. At most locations, the thickness of the embankment is greater than 4 feet. In all SHRP test sections, sampling and field testing shall commence from the prepared embankment surface. In the control section an embankment will not be constructed, and cut and fill operations will be limited to  $\pm 1$  ft. In this section sampling and field testing shall commence from the prepared subgrade surface.

A summary of the samples to be obtained and field tests to be performed follows.

#### **3.1 Subgrade (Control Section Only)**

The following sampling and field tests shall to be performed on the subgrade.

- Obtain thin-wall tube samples.
- Conduct moisture and density tests using the nuclear gauge on the prepared subgrade surface.
- Conduct elevation measurements on the prepared subgrade surface.
- Conduct deflection testing using a Falling Weight Deflectometer (FWD) along the outer wheelpath and mid-lane of the compacted subgrade surface.
- Conduct a probe on the shoulder of the section to a depth of 20 feet from the prepared subgrade surface to detect the presence of a rigid layer.

### **3.2 Embankment (SHRP Sections)**

- Conduct moisture and density tests using the nuclear gauge on the prepared embankment surface.
- Obtain thin-wall tube samples from the prepared embankment surface.
- Obtain bulk samples and moisture samples from the prepared embankment surface.
- Conduct elevation measurements on the prepared embankment surface.
- Conduct deflection testing using a Falling Weight Deflectometer (FWD) along the outer wheelpath and mid-lane of the compacted embankment surface.
- Conduct probes on the shoulder of the sections to a depth of 20 feet from the prepared embankment surface to detect the presence of a rigid layer.

### **3.3 Subbase (Control Section Only)**

- Conduct moisture and density tests using the nuclear gauge on the prepared subbase.
- Obtain bulk samples and moisture samples from the compacted subbase surface.
- Conduct elevation measurements on the prepared subbase surface.
- Conduct deflection testing using a Falling Weight Deflectometer (FWD) along the outer wheelpath and mid-lane of the compacted subbase. Due to the gradation of the subbase soil being designed for drainage and easily displaced under tires, FWD testing was not performed on this layer.

### **3.4 Dense Graded Aggregate Base (DGAB)**

- Conduct nuclear moisture and density tests on compacted aggregate base using the nuclear gauge.
- Obtain bulk samples and moisture samples from the compacted aggregate base.
- Conduct elevation measurements on the compacted aggregate base surface.
- Conduct deflection testing using a Falling Weight Deflectometer (FWD) along the outer wheelpath and mid-lane of the compacted aggregate base.

### **3.5 Permeable Asphalt Treated Base (PATB)**

- Obtain bulk samples of uncompacted permeable asphalt treated base material from the paver or the haul vehicle immediately prior to lay-down.
- Conduct elevation measurements on the prepared surface of the permeable asphalt treated base.
- Conduct deflection testing using a Falling Weight Deflectometer (FWD) along the outer wheelpath and mid-lane of the compacted permeable asphalt treated base.

### **3.6 Asphalt Treated Base (ATB)**

- Obtain bulk samples from uncompacted asphalt treated base material from the paver or haul vehicle immediately prior to lay-down. Obtain bulk samples of the asphalt cement used in the ATB layer.
- Conduct nuclear density tests on the compacted asphalt treated base.
- Conduct elevation measurements on the prepared surface.
- Obtain cores from the asphalt treated base layer.
- Conduct deflection testing using a Falling Weight Deflectometer (FWD) along the outer wheelpath and mid-lane.

### **3.7 Asphalt Concrete (AC)**

- Obtain bulk samples of uncompacted asphalt concrete from the paver or haul vehicle immediately prior to laydown. Samples from each asphalt concrete mix are required. Obtain bulk samples of asphalt cement used in these layers.
- Conduct nuclear density tests on compacted asphalt concrete surface using the nuclear gauge.
- Conduct elevation measurements on the prepared asphalt concrete surface.
- Obtain cores from asphalt concrete layer.
- Obtain bulk samples of asphalt cement used in the asphalt concrete from the plant. If more than one asphalt cement type is used, obtain samples from each type.

### **3.8 Samples for Long Term Storage**

- Obtain samples of the different types of asphalt cement used for asphalt based layers.
- Obtain bulk samples of the graded coarse and fine aggregate used for all asphalt based layers except the permeable asphalt treated base.
- Bulk samples of the uncompacted mix from all asphalt based layers.

The material sampling requirements for the SHRP test sections and the control section are summarized in Table 3. Additional samples are required for the LTPP Materials Reference Library. These sampling requirements are described in Section 5.9.

A summary of the field tests that are to be conducted on each layer are presented in Table 4. The field tests summarized according to the type of test is presented in Table 5.

The laboratory tests to be conducted on the subgrade, embankment, subbase, dense graded aggregate base, permeable asphalt treated base, asphalt treated base and asphalt concrete material are given in Table 6. This table also gives the SHRP test designations and the SHRP Protocols for all tests. A summary of all laboratory tests grouped according to test types is shown in Table 7.

The detailed plan for sampling and field testing showing the sampling and field test locations as well as the detailed laboratory testing plan which allocates samples for each laboratory test will be described in the next sections.

## **4.0 OVERVIEW OF SAMPLING AND TESTING PLAN**

Figure 2 gives an overview of the layer types and thickness in all sections. Figures 4 through 16 show the location and type of samples to be obtained and field tests to be performed on each layer at all test sections. Figure 3 gives the legend for the notations used in these figures. In addition to the field tests shown in these figures, the following tests shall also be conducted: (1) elevation measurements shall be conducted on all layers. (2) FWD testing shall be conducted on all layers except asphalt concrete. All sampling and field testing in each layer shall be completed before construction begins on the next layer. In these figures, Station 0+00 is the beginning of the monitoring portion at each section while Station 5+00 is the end of the monitoring portion of a section. Locations for field tests and sampling in these figures are specified relative to the beginning of the monitoring portion of each section.

An overview of the sampling and field testing requirements for the different pavement layers for all sections are shown in Figs. 17 - 22. All test sections shown in these figures are 600 ft. long, which include the monitoring length of 500 ft. and the 50 ft. sampling area at both ends of the monitoring section.

## **5.0 SAMPLING AND TESTING FOR EACH LAYER**

### **5.1 Introduction**

Sampling, field tests and laboratory tests for each pavement layer will be described in this section. Refer to Figures 4 to 16 for detailed sampling and testing locations on each test section, and to Figures 17 to 22 for an overview of sampling and testing on each pavement layer. All sampling and field tests shall be conducted according to the specified standards for sampling and testing. These standards are either AASHTO standards, ASTM standards or methods specific to the SHRP program. All laboratory tests shall be conducted according to protocols developed for the SPS-1 experiment that are in Appendix E.2 of the SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (Ref. 1).

The laboratory tests specified in this document shall be conducted by MDOT or an MDOT designated laboratory and by the FHWA-LTPP Materials Testing Contractor. Sampling, field testing and laboratory testing for each layer is described in the next sections. Due to construction scheduling, test section layout changes since the original plan for MST was developed, offsets to avoid non-representative sampling areas, and to facilitate obtaining samples, some of the sampling locations and testing has been modified from the original MST guide.

### **5.2 Subgrade (Control Section Only) and Embankment**

Sampling and testing shall be conducted on the prepared embankment surface on all SHRP test sections. In the control section, samples shall be obtained from the existing subgrade and tests shall be performed on the prepared subgrade surface.

#### **5.2.1 Sampling**

Bulk samples and moisture samples from the prepared embankment surface shall be obtained from the SHRP section at the locations given in Table 8. In the control section, bulk samples and moisture samples shall be obtained from the subgrade at the location

given in Table 8. Prior to obtaining bulk samples at these locations, nuclear moisture/density testing must be conducted at the sampling locations. The bulk sampling shall consist of a single excavation, 2 feet by 2 feet in area and 12 inches deep. Approximately 400 pounds of material shall be obtained from each sampling location. From this sample, 100 pounds shall be shipped to the state laboratory or their designee and 300 pounds shall be shipped to the FHWA-LTPP laboratory material testing contractor.

Thin-wall tube samples shall be obtained from the prepared embankment at the SHRP sections and from the subgrade in the control section. The locations for thin-wall sampling is shown in Table 9. The Shelby tubes shall have an outside diameter of 3 in., an inner diameter of 2.8 in. and be 24 in. long. Samples shall be obtained to a depth of 4 feet from the surface. Therefore, at each location two Shelby tube samples are obtained. These operations shall be performed in accordance with AASHTO T207, "Thin-wall Tube Sampling of Soils."

If thin-wall tube samples can not be obtained, split-spoon samples shall be obtained. Split-spoon sampling shall be performed using a 140 pound hammer, 30 in. drop and a sampler specified in AASHTO T206. After performing split-spoon sampling, the barrel shall be opened and the recovered material shall be carefully examined and logged to record the length of the recovery and description of the soil. The soil layers should be identified and recorded on Sampling Data Sheet 4-1 (see Appendix B in Ref. 3). If rock, boulders or other forms of dense materials are encountered within four feet of the top of the layer, another attempt for sampling shall be made at a different location with a longitudinal offset of 5 to 10 feet. If refusal occurs at a second location, split-spoon sampling shall be terminated.

### **5.2.2 Field and Laboratory Tests**

A summary of the field and laboratory test plan for the embankment and subgrade are shown in Tables 10 and 11, respectively. These tables also give the SHRP Protocols that shall be followed when conducting these tests. The applicable procedures outlined in SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (Ref. 1) shall be followed prior to conducting any laboratory tests.

The following field tests shall be conducted on the prepared embankment in the SHRP sections and on the prepared subgrade in the control section.

1. Density and Moisture Tests: Locations for in-place density and moisture tests on the prepared embankment in the SHRP sections and on the prepared subgrade in the control section are shown in Table 12. The density/moisture measurements shall be

made using direct transmission method for density and the backscatter method for moisture determination. Density determinations shall be conducted using AASHTO T238-86, "Standard Method for Density of Soil and Soil Aggregate in Place by Nuclear Method (Shallow Depth)" , Method B - Direct Transmission. Moisture measurements shall be conducted using AASHTO T239-86, "Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depths, Backscatter Method)". For the density test, the rod shall be imbedded 4 to 8 inches below the layer surface as appropriate to test the full layer. At each testing location, four readings of one minute each shall be conducted with the nuclear testing instrument rotated 90° between each reading.

2. Elevation Measurements: Elevation measurements shall be performed on the surface of the prepared embankment in the SHRP sections and on the prepared subgrade in the control section. The elevation measurements shall be conducted at the following locations: (1) five points across the lane, at 50 ft. intervals between the beginning and end of the monitoring section. (2) five points across the lane, at 25 feet prior to the beginning of the monitoring section and 25 feet from the end of the monitoring section. The locations at which the elevation measurements are to be performed within a section are given in Table 13. Each elevation measurement shall be measured with an accuracy within 0.01 ft.

3. Auger Probes : Auger probes to a depth of 20 feet from the prepared embankment surface in the SHRP sections and the prepared subgrade surface in the control section shall be performed on the shoulder at locations specified in Table 14. These probes are conducted to determine if significantly dense layers exist within 20 feet from the top of the prepared surface. If refusal occurs prior to 20 ft, the probe shall be continued at a nearby location 5 to 10 feet away. If refusal occurs at the second location, the auger probe activity shall be terminated.

4. Deflection Testing: Deflection testing using a Falling Weight Deflectometer (FWD) shall be performed on the prepared embankment on the SHRP sections and on the prepared subgrade on the control section. The locations at which deflection tests are to be carried out within a test section are shown in Table 15. The procedures given in SHRP Protocol P59 shall be followed when conducting deflection testing.

### **5.3 Subbase (Control Section Only)**

#### **5.3.1 Sampling**

The subbase is present only in the Control Section. A bulk sample and a moisture sample from the uncompacted subbase shall be obtained at the location given in Table 17.

Before the bulk sample is taken, a nuclear moisture/density test has to be performed at the bulk sampling location (see 5.3.2 for details on nuclear/density test). The bulk sample shall comprise of 400 pounds of material. The samples shall be obtained following the procedures outlined in Section 3.5 of the SHRP-LTPP Guide for Field Materials Sampling, Testing, and Handling (Ref. 2).

### **5.3.2 Field and Laboratory Tests**

A summary of the field and laboratory tests to be conducted on the subbase is shown in Table 16. This table also gives the SHRP Protocols that shall be followed when conducting these tests. The applicable procedures outlined in SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (Ref. 1) shall be followed prior to conducting any laboratory tests.

The following field tests shall be conducted on the prepared subbase surface.

1. In Place Density and Moisture Tests: Perform tests on top of the compacted subbase at locations specified in Table 19. The density/moisture measurements shall be made using direct transmission method for density and the backscatter method for moisture determination. Density determinations shall be conducted using AASHTO T238-86, "Standard Method for Density of Soil and Soil Aggregate in Place by Nuclear Method (Shallow Depth)" Method B - Direct Transmission. Moisture measurements shall be conducted using AASHTO T239-86, "Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depths, Backscatter Method)". For the density test the rod shall be imbedded 4 to 8 inches below the layer surface as appropriate to test the full layer. At each testing location, four readings of one minute each shall be conducted with the nuclear testing instrument rotated 90° between each reading.

2. Elevation Measurements: - Elevation measurements Shall be performed on the surface of the compacted subbase at the following locations: (1) five points across the lane, at 50 ft. intervals between the beginning and end of the monitoring section. (2) five points across the lane, at 25 feet prior to the beginning of the monitoring section and 25 feet from the end of the monitoring section. The locations at which the elevation measurements are to be performed within a section are given in Table 13. Each elevation measurement shall be measured with an accuracy within 0.01 ft.

3. Deflection Testing: Deflection testing using a Falling Weight Deflectometer (FWD) shall be performed on the compacted subbase at the locations shown in Table 15. The procedures given in SHRP Protocol P59 shall be followed when conducting deflection testing. Due to the gradation of the subbase soil being designed for drainage and easily displaced under tires, FWD testing was not performed on this layer.

## **5.4 Dense Graded Aggregate Base**

### **5.4.1 Sampling**

Bulk samples and moisture samples from the uncompacted aggregate base material shall be obtained at the approximate locations shown in Table 17. Before obtaining the bulk samples, nuclear moisture and density tests have to be performed at the bulk sampling locations. Each bulk sample shall contain 400 pounds of material. A 100 pound sample shall be shipped to the state laboratory or their designee and a 300 pound sample shall be shipped to the FHWA-LTPP Laboratory Material Testing Contractor.

### **5.4.2 Field and Laboratory Tests**

A summary of the field and laboratory tests to be conducted on the dense graded aggregate base is shown in Table 18. This table also gives the SHRP Protocols that shall be followed when conducting these tests. The applicable procedures outlined in SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (Ref. 1) shall be followed prior to conducting any laboratory tests.

The following field tests shall be conducted on the prepared aggregate base surface.

1. In Place Nuclear Density and Moisture Tests: Perform tests on top of the prepared aggregate base at locations specified in Table 19. The density/moisture measurements shall be made using direct transmission method for density and the backscatter method for moisture determination. Density determinations shall be conducted using AASHTO T238-86, "Standard Method for Density of Soil and Soil Aggregate in Place by Nuclear Method (Shallow Depth)" Method B - Direct Transmission. Moisture measurements shall be conducted using AASHTO T239-86, "Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depths, Backscatter Method)". For the density test, the rod shall be imbedded 4 to 8 inches below the layer surface as appropriate to test the full layer. At each testing location, four readings of one minute each shall be conducted with the nuclear testing instrument rotated 90° between each reading.

2. Elevation Measurements: Elevation measurements shall be performed on the surface of the prepared aggregate base at the following locations: (1) five points across the lane, at 50 ft. intervals between the beginning and end of the monitoring section. (2) five points across the lane, at 25 feet prior to the beginning of the monitoring section and 25 feet from the end of the monitoring section. Elevation measurements shall be performed on all test sections which contain an aggregate base (Seven SHRP Sections and the Control Section). The locations at which the elevation measurements are to be performed within a

section are given in Table 13. Each elevation measurement shall be measured with an accuracy within 0.01 ft.

3. Deflection Testing: Deflection testing using a Falling Weight Deflectometer (FWD) shall be performed on the prepared aggregate base at all test sections which contain an aggregate base (Seven SHRP Sections and the Control Section). The locations at which deflection tests are to be carried out within a test section is shown in Table 15. The procedures given in SHRP Protocol P59 shall be followed when conducting deflection testing.

## **5.5 Permeable Asphalt Treated Base (PATB)**

### **5.6.1 Sampling**

In the Control Section, the permeable asphalt material is referred to as asphalt stabilized permeable base. Bulk samples of uncompacted permeable asphalt treated base material shall be obtained from the paver immediately prior to laydown. The samples shall be obtained from the mix that is to be placed at the locations shown in Table 20. Each sample shall contain 100 pounds of material. These samples shall be obtained in accordance with AASHTO T168.

### **5.5.2 Field and Laboratory Tests**

A summary of the field tests to be conducted on the prepared PATB surface and laboratory tests to be conducted on the uncompacted samples of PATB are shown in Table 21. The applicable procedures outlined in SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (Ref. 1) shall be followed prior to conducting any laboratory tests. The following field tests shall be conducted on the prepared PATB surface.

1. Elevation Measurements: Elevation measurements shall be performed on the surface of the compacted permeable asphalt treated base at the following locations: (1) five points across the lane, at 50 ft. intervals between the beginning and end of the monitoring section. (2) five points across the lane, at 25 feet prior to the beginning of the monitoring section and 25 feet from the end of the monitoring section. Elevation measurements shall be performed on all test sections having a PATB surface (Six SHRP Sections and the Control Section). The locations at which the elevation measurements are to be performed within a section are given in Table 13. Each elevation measurement shall be measured with an accuracy within 0.01 ft.

2. Deflection Testing: Deflection testing using a Falling Weight Deflectometer (FWD) shall be performed on the compacted PATB (Six SHRP Sections and the Control Section). The locations at which deflection tests are to be carried out within a test section is shown in Table 15. The procedures given in SHRP Protocol P59 shall be followed when conducting deflection testing.

## **5.6 Asphalt Treated Base (ATB)**

### **5.6.1. Sampling**

#### **Bulk Samples**

Bulk samples of uncompacted asphalt treated base material shall be obtained from the paver immediately prior to laydown. The samples shall be obtained from the mix that is to be placed at the locations shown in Table 22. Each sample shall contain 200 pounds of material. These samples shall be obtained in accordance with AASHTO T168 and shipped to the laboratory. Bulk samples of the asphalt cement used in the ATB are to be obtained. One sample of the asphalt cement was obtained.

**Core Samples**: Cores of 4 in. diameter have to be obtained from the asphalt treated base. Cores from the asphalt treated base shall be obtained at the same time when cores are obtained from the asphalt concrete surface. The locations at which cores from the asphalt treated base have to be obtained is shown in Table 23. The offset of these cores from the outer edge of the pavement are shown in Table 27. The direction of traffic shall be marked on all cores.

### **5.6.2 Field and Laboratory Tests**

The laboratory testing plan for uncompacted asphalt treated base material and cores from asphalt treated base is shown in Table 24. This table also includes the field tests to be performed on the prepared asphalt treated base surface. The applicable procedures outlined in SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (Ref. 1) shall be followed prior to conducting any laboratory tests. The visual examination and determination of thickness of the cores shall be performed before conducting any laboratory tests on the cores.

The tests listed to be performed on the asphalt cement from the plant in Table 24 has to be performed on these samples.

The following field tests shall be conducted on the prepared asphalt treated base surface.

1. Nuclear Density Tests: Nuclear density testing shall be conducted on the prepared surface of the asphalt treated base at locations specified in the Table 25. The density testing shall be performed at the specified locations using AASHTO T238-86, backscatter mode. Each testing location shall have four readings with the density instrument rotated 90° between each reading.

2. Elevation Measurements: Elevation measurements shall be performed on the prepared asphalt treated base surface at the following locations: (1) five points across the lane, at 50 ft. intervals between the beginning and end of the monitoring section. (2) five points across the lane, at 25 feet prior to the beginning of the monitoring section and 25 feet from the end of the monitoring section. Elevation measurements shall be performed on all test sections containing an asphalt treated base. The locations at which the elevation measurements are to be performed within a section are given in Table 13. Each elevation measurement shall be measured with an accuracy within 0.01 ft.

2. Deflection Testing: Deflection testing using a Falling Weight Deflectometer (FWD) shall be performed on the prepared asphalt treated base at all test sections containing an asphalt treated base. The locations at which deflection tests are to be carried out within a test section are given in Table 15. The procedures given in SHRP Protocol P59 shall be followed when conducting deflection testing.

## **5.7 Asphalt Concrete (AC)**

In the SHRP sections that have an asphalt concrete thickness of 4 inches, two types of asphalt concrete layers are used. In the SHRP sections that have an asphalt concrete thickness of 7 inches and in the control section that has an asphalt concrete thickness of 6.5 inches, three types of asphalt concrete layers are used.

### **5.7.1 Sampling**

#### **Bulk Sampling**

Bulk samples of uncompacted asphalt concrete material shall be obtained from the paver or the haul vehicle from the mix that is to be placed approximately at the locations shown in Table 26. At each location, samples shall be obtained from the different asphalt concrete layers that are placed at that location. Each asphalt concrete sample shall contain 200 pounds of material. These samples shall be obtained in accordance with AASHTO T168 and shipped to the laboratory.

#### **Asphalt Cement**

Three 5 gallon samples of the asphalt cement that is used for the production of the asphalt concrete shall be obtained from the plant. Each 5 gallon sample shall be obtained

at different times. The sampling schedule and the sample designation are given in Table 26.

**Core Samples:** Core samples of 4 inch diameter have to be obtained from the compacted asphalt concrete surface. The locations from which the cores are to be obtained are given in Table 27. Cores from the asphalt treated base shall be obtained at locations specified in Table 23 when coring for asphalt concrete samples.

Coring operations shall be performed in accordance with AASHTO T24-86, "Obtaining and Testing Drilled Cores and Sawed Beams of Concrete." Carbide or diamond bit drilling is to be performed. Mist or air cooled drilling is preferred as the best method to minimize water contamination of the underlying layers. If necessary, to obtain cores of suitable quality, the pavement may be cooled by dry-ice or other means prior to coring. Cores of multiple layers of asphalt concrete shall not be separated in the field. Plugs shall not be inserted in cores. Suction cups or wire pulls have been successfully used for core extraction. Care shall be taken to obtain cores at a 90 degree angle to the pavement surface and that the edges are straight, intact, smooth and suitable for laboratory testing. Details on tolerance and quality Control of the cores are included in Section 3.3.6 (Ref. 3). The direction of traffic shall be marked on all cores using a waterproof marking material. All cores must be dried before packaging.

### **5.7.2 Field and Laboratory Tests**

The field tests to be conducted on the compacted asphalt concrete surface as well as laboratory tests to be conducted on the uncompacted material and cores of asphalt concrete are shown in Table 28. This table also gives the SHRP Protocols that are to be followed when conducting these tests. The applicable procedures outlined in SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (Ref. 1) shall be followed prior to conducting any laboratory tests. The visual examination and determination of thickness of the cores shall be performed before conducting any laboratory tests on the cores. The following field tests are to be conducted on the prepared asphalt concrete surface.

1. **Nuclear Density Tests:** The locations for nuclear density tests are specified in Table 29. Nuclear density tests shall be conducted on each layer of asphalt concrete. The density testing shall be performed at the specified locations using AASHTO T238-86, backscatter mode. Each testing location shall have four readings with the density instrument rotated 90° between each reading.

2. **Elevation Measurements:** Elevation measurements shall be performed on the surface of the finished asphalt concrete surface at the following locations: (1) five points

across the lane, at 50 ft. intervals between the beginning and end of the monitoring section. (2) five points across the lane, at 25 feet prior to the beginning of the monitoring section and 25 feet from the end of the monitoring section. Elevation measurements shall be performed on all sections (12 SHRP Sections and Control Section). The locations at which the elevation measurements are to be performed within a section are given in Table 13. Each elevation measurement shall be measured with an accuracy within 0.01 ft.

## **5.8 Samples for Long Term Storage**

The LTPP Materials Reference Library requires additional samples for long term storage. The following samples are required for long term storage.

1. Asphalt Cement: Three five gallon pails of asphalt cement shall be obtained from the plant for each different type of asphalt cement used in the project. The asphalt based layers that have to be considered are the different asphalt concrete layers, asphalt treated base and permeable asphalt treated base. Since one type of asphalt cement was used for both PATB and ATB layers in the project, and one type was used for the asphalt concrete layers, two sample units (Three 5 gallon samples) of the asphalt cement shall be sampled. Sampling of the asphalt cement for the MRL was reduced to two 5 gallon samples due to the necessity of retaining one of the samples for the State's testing. The asphalt cement shall be sampled from the plant using AASHTO T 40, "Sampling Bituminous Materials", after the asphalt cement has been heated for mixing.

2. Graded Coarse and Fine Aggregate: One fifty five (55) gallon drum of the graded coarse and fine aggregate shall be obtained for each asphalt based layer except the permeable asphalt treated base, from the plant. If different asphalt concrete mixes are used in the project, a sample of the graded coarse and fine aggregate has to be obtained for each asphalt concrete mix. This material shall be sampled in conformance with applicable portions of AASHTO T2, "Sampling Aggregates". For drum plants, the aggregates should be obtained from the charging (inclined) conveyor using the bypass chute, if possible. Otherwise, the sample should be taken from the belt on the charging conveyor. For batch plants, the aggregate can be sampled from the inclined conveyor at the dryer.

3. Uncompacted Asphalt Mix: Three five (5) gallon pails of the finished uncompacted mix shall be obtained from each asphalt based layer. Therefore, samples have to be obtained from each layer of asphalt concrete, asphalt treated base and the permeable asphalt treated base. The samples shall be obtained from the paver or the haul vehicle immediately prior to laydown. These materials shall be sampled in conformance

with AASHTO T168, "Sampling Bituminous Paving Mixtures". The different layers of asphalt concrete are to be treated as different material (e.g. surface vs. binder).

The containers (barrels and buckets) for the storage of the samples will be provided by the LTPP Materials Reference Library. These containers are of special manufacture to accommodate long-term storage. Containers shall be shipped by suitable means as agreed upon by the FHWA-LTPP Regional Engineer.

## **6.0 LOGS AND REPORTS**

During field sampling operations, two types of forms must be completed. These are the Field Operations Information Forms and the Sampling Data Sheets. Field Operations Information Forms are used to record general information concerning the pavement test sections and the materials samples. Sampling Data Sheets are used to record the actual information for each sampling area or sampling location. If these forms are completed by a person other than the LTPP representative, the data must be reviewed by the LTPP representative prior to forwarding the sheets to the appropriate personnel. Further details are given in Section 3.3.13 (Ref. 2). Details on assembly and transmittal of data sheets are described in Section 3.3.16 (Reference 3).

## **7.0 HANDLING AND SHIPPING OF SAMPLES**

Because of the research nature of this project and because samples will be shipped over long distances, it is extremely important that the samples be packaged carefully. Sections 3.3.7, 3.3.8, 3.3.9, 3.3.10 and 3.3.11 in Reference 3 give detailed guidelines on packaging and shipping of samples.

## **8.0 SAMPLE STORAGE**

The guidelines for storing materials from the LTPP experiment are described in Section 3.3.17 in Reference 3.

## **9.0 LABORATORY TESTING**

Procedures to be followed in laboratory testing are described in Section 4 of the Materials sampling and Testing Requirements for SPS-1 (Reference 3) and in the SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (Reference 1). Laboratory tracking table for the use of the State laboratory and the FHWA laboratory are included with this report.

## **10.0 REFERENCES**

1. SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (PCC, Bituminous Materials, Aggregates and Soils), Operational Guide No. SHRP-LTPP-OG-004, Strategic Highway Research Program, Revised and Amended July 1993.
2. SHRP-LTPP Guide for Field Materials Sampling, Testing and Handling, Version 2.0, Operational Guide No. SHRP-LTPP-OG-006, Strategic Highway Research Program, May 1990.
3. Specific Pavement Studies, Material Sampling and Testing Requirements for Experiment SPS-1, Strategic Study of Structural Factors for Flexible Pavements, Draft, Federal Highway Administration, LTPP Division, September 1993.
4. Specific Pavement Studies: Experimental Design and Research Plan for Experiment SPS-1, Strategic Study of structural Factors for Flexible Pavements, February 1990.
5. Specific Pavement Studies: Construction Guidelines for Experiment SPS-1, Strategic Study of Structural Factors for Flexible Pavements, Federal Highway Administration, December 1993.

TABLE 1. LIMITS OF TEST SECTIONS

Section Number	Beginning of 600 ft Section	End of 600 ft Section
260121	1356+00	1350+00
260120	1349+00	1343+00
260118	1335+25	1329+25
260116	1328+25	1322+25
260124	1321+50	1315+50
260123	1310+50	1304+50
260122	1262+50	1256+50
260113	1255+50	1249+50
260114	1248+50	1242+50
260119	1241+50	1235+50
260117	1227+50	1221+50
260115	1220+50	1214+50
260159*	1235+00	1230+00
* NOTE: Control Section. Limits shown are 500 ft. monitoring limits.		

TABLE 2. DESIGN FEATURES OF TEST SECTIONS

Test Section Number	AC Thickness (in) Layer 1	Material and Thickness (in) Layer 2	Material and Thickness (in) Layer 3	Material and Thickness (in) Layer 4
260121	4"	PATB 4"	DGAB 12"	—
260120	4"	PATB 4"	DGAB 8"	—
260118	4"	ATB 8"	DGAB 4"	—
260116	4"	ATB 12"	—	—
260124	7"	ATB 12"	PATB 4"	—
260123	7"	ATB 8"	PATB 4"	—
260122	4"	ATB 4"	PATB 4"	—
260113	4"	DGAB 8"	—	—
260114	7"	DGAB 12"	—	—
260119	7"	PATB 4"	DGAB 4"	—
260117	7"	ATB 4"	DGAB 4"	—
260115	7"	ATB 8"	—	—
260159*	6½"	ASPB 4"	AB 4"	Subbase 24"

NOTE: \* – Control Section (Constructed According to Standard MDOT Practice)  
 AC – Asphalt Concrete  
 ATB – Asphalt Treated Base  
 DGAB – Dense Graded Aggregate Base  
 PATB – Permeable Asphalt Treated Base  
 ASPB – Asphalt Stabilized Permeable Base  
 AB – Aggregate Base

TABLE 3. MATERIAL SAMPLING REQUIREMENTS FOR SHRP SECTIONS AND CONTROL SECTION

Material Sample	Number of Samples
<b>SUBGRADE (CONTROL SECTION ONLY)</b> Thin-wall Tube Samples (Thin-wall tube samples were not obtained at all locations, split-spoon samples were substituted. At each location 2 tubes or 2 spoons or combination per hole were obtained)	3 Locations (6 Samples)
<b>EMBANKMENT</b>	
Bulk Samples from Compacted Surface, 400 lb per sample	7
Moisture Content Samples	7
Thin-wall Tube Samples (Thin-wall tube samples were not obtained at all locations, split-spoon samples were substituted. At each location 2 tubes or 2 spoons or combination per hole were obtained)	18 Locations (36 Samples)
<b>SUBBASE (CONTROL SECTION)</b>	
Bulk Sample from Compacted Surface, 400 lb per sample	1
Moisture Content Samples	1
<b>DENSE GRADED AGGREGATE BASE</b>	
Bulk Samples from Compacted Surface, 400 lb per sample	4
Moisture Content Samples	4
<b>DENSE GRADED AGGREGATE BASE (CONTROL SECTION)</b>	
Bulk Samples from Compacted Surface, 400 lb per sample	1
Moisture Content Samples	1
<b>PERMEABLE ASPHALT TREATED BASE</b>	
Bulk Samples – Uncompacted, 100 lb per sample	4
<b>ASPHALT STABILIZED PERMEABLE BASE (CONTROL SECTION)</b>	
Bulk Samples – Uncompacted, 100 lb per sample	1
<b>ASPHALT TREATED BASE</b>	
Cores – 4 inch diameter	34
Bulk Samples – Uncompacted, 200 lb per sample	4
Asphalt Cement used for Asphalt Concrete – 5 gallon samples	1
<b>ASPHALT CONCRETE</b>	
Cores – 4 inch diameter	66
Bulk Samples – uncompacted, 200 lb per sample Note: Obtain a sample from each type of asphalt concrete used (leveling layer 1, leveling layer 2, surface) at the specified locations.	11
Asphalt Cement used for Asphalt Concrete – 5 gallon samples	3
<b>SAMPLES FOR LONG TERM STORAGE</b>	
Asphalt Cement – Five gallon samples of each type of asphalt cement used in the project	1
ATB, PATB, ASPB (ALL USING SAME CEMENT)	2
ASPHALT CONCRETE MIXES (ALL USING SAME CEMENT)	3
Graded Coarse and Fine Aggregate – One fifty five gallon drum of the graded coarse and fine aggregate	
Asphalt Treated Base	1
Asphalt Concrete (One sample for each type of asphalt concrete, Three types used)	3
Uncompacted Asphalt Mix – Five gallon pails of the uncompacted mix from each of the following:	
Asphalt Treated Base	3
Permeable Asphalt Treated Base	2
Asphalt Stabilized Permeable Base (Control Section)	2
Each Asphalt Concrete Mix (Three Types)	9

TABLE 4. SUMMARY OF FIELD TESTS ON EACH LAYER

Layer and Test/Measurement	Number of Locations	SHRP Protocol
<b>SUBGRADE (CONTROL SECTION ONLY)</b>		
Density and Moisture Tests (Nuclear Gauge)	3	Section 3.3.14, Reference 3
Shoulder Probes (20 ft) to Detect Rigid Layer	1	Section 3.8, Reference 2
Elevation Measurements	65	Figure 6, Reference 5
Falling Weight Deflectometer Tests	25	P59
<b>EMBANKMENT</b>		
Density and Moisture Tests (Nuclear Gauge)	43	Section 3.3.14, Reference 3
Shoulder Probes (20 ft) to Detect Rigid Layer	6	Section 3.8, Reference 2
Elevation Measurements	780	Figure 6, Reference 5
Falling Weight Deflectometer Tests	300	P59
<b>SUBBASE (CONTROL SECTION ONLY)</b>		
Density and Moisture Tests (Nuclear Gauge)	4	Section 3.3.14, Reference 3
Elevation Measurements	65	Figure 6, Reference 5
Falling Weight Deflectometer Tests	25	P59
<b>DENSE GRADED AGGREGATE BASE</b>		
Density and Moisture Tests (Nuclear Gauge)	25	Section 3.3.14, Reference 3
Elevation Measurements	455	Figure 6, Reference 5
Falling Weight Deflectometer Tests	175	P59
<b>DENSE GRADED AGGREGATE BASE (CONTROL SECTION)</b>		
Density and Moisture Tests (Nuclear Gauge)	4	Section 3.3.14, Reference 3
Elevation Measurements	65	Figure 6, Reference 5
Falling Weight Deflectometer Tests	25	P59
<b>PERMEABLE ASPHALT TREATED BASE</b>		
Elevation Measurements	390	See Section 5.6.2
Falling Weight Deflectometer Tests	150	P59
<b>ASPHALT STABILIZED PERMEABLE BASE (CONTROL SECTION)</b>		
Elevation Measurements	65	See Section 5.6.2
Falling Weight Deflectometer Tests	25	P59
<b>ASPHALT TREATED BASE</b>		
Density Tests (Nuclear Gauge)	21	Section 3.3.14, Reference 3
Elevation Measurements	455	Figure 6, Reference 5
Falling Weight Deflectometer Tests	175	P59
<b>ASPHALT SURFACE</b>		
Density Tests (Nuclear Gauge) Note: Perform Tests on each layer type	99	Section 3.3.14, Reference 3
Elevation Measurements Note: Perform measurements on final surface	845	Figure 6, Reference 5

**TABLE 5. SUMMARY OF FIELD TESTS BY TEST TYPE**

Test	Total Tests/Locations	SHRP Protocol
Shoulder Probes (20 ft) to Detect Rigid Layer	7	Section 3.8, Reference 2
Density and Moisture Tests (Subgrade, Embankment, Aggregate Base, Subbase)	79	Section 3.3.14, Reference 3
Density Tests (AC and ATB)	120	Section 3.3.14, Reference 3
Elevation Measurements	3185	Figure 6, Reference 5
Falling Weight Deflectometer Tests (FHWA TESTS SURFACE LAYER OF AC)	900	P59

TABLE 6. LABORATORY MATERIALS TESTING PLAN FOR EACH LAYER (CONTINUED)

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Test Conducted by:	
				State	FHWA
<b>DENSE GRADED AGGREGATE BASE (SHRP AND CONTROL SECTIONS)</b>					
<b>TESTING ON BULK SAMPLES</b>					
Particle Size Analysis	UG01	P41	5	--	X
Sieve Analysis (washed)	UG02	P41	5	--	X
Atterberg Limits	UG04	P43	5	--	X
Moisture-Density Relations	UG05	P44	5	--	X
Resilient Modulus	UG07	P46	5	--	X
Classification	UG08	P47	5	--	X
Permeability	UG09	P48	5	X	--
Natural Moisture Content	UG10	P49	5	--	X
<b>PERMEABLE ASPHALT TREATED BASE OR ASPHALT STABILIZED PERMEABLE BASE</b>					
<b>TESTING ON BULK SAMPLES</b>					
Asphalt Content (Extraction)	AC04	P04	5	X	--
Extracted Aggregate - Gradation	AG04	P14	5	X	--
<b>ASPHALT TREATED BASE</b>					
<b>TESTING ON CORE SAMPLES</b>					
Core Examination/Thickness	AC01	P01	34	X (22)	X (12)
Bulk Specific Gravity	AC02	P02	34	X (22)	X (12)
Resilient Modulus	AC07	P07	9	--	X
Tensile Strength	AC07	P07	12	--	X
<b>TESTING ON BULK SAMPLES</b>					
Maximum Specific Gravity	AC03	P03	4	X	--
Asphalt Content (Extraction)	AC04	P04	4	X	--
Moisture Susceptibility	AC05	P05	2	X	--
<b>Asphalt Cement (from extracted bulk sample)</b>					
Abson Recovery	AE01	P21	4	X	--
Penetration at 77F, 115F	AE02	P22	4	X	--
Specific Gravity (60F)	AE03	P23	4	X	--
Viscosity at 77F	AE04	P24	4	X	--
Viscosity at 140F, 275F	AE05	P25	4	X	--
<b>Extracted Aggregate (from extracted bulk sample)</b>					
Specific Gravity - Coarse Aggregate	AG01	P11	4	X	--
Specific Gravity - Fine Aggregate	AG02	P12	4	X	--
Gradation of Aggregate	AG04	P14	4	X	--
NAA Test for Fine Aggregate	AG05	P14A	4	X	--
<b>Asphalt Cement: (From Tanker)</b>					
Penetration at 77F, 115F	AE02	P22	1	X	--
Specific Gravity (60F)	AE03	P23	1	X	--
Viscosity at 77F	AE04	P24	1	X	--
Viscosity at 140F, 275F	AE05	P25	1	X	--

TABLE 6. LABORATORY MATERIALS TESTING PLAN FOR EACH LAYER

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Test Conducted by:	
				State	FHWA
<b>SUBGRADE (CONTROL SECTION ONLY)</b>					
<b>TESTING ON THIN-WALL SAMPLES</b>					
Resilient Modulus (Thin wall tubes) Conduct test on bulk sample if thin wall tubes are not test quality (Number of tests = Number of Tube Samples - Number of Additional Samples)	SS07	P46	1	-	X
Classification - Thin wall (visual manual only)	SS04	P52	2	X (1)	X (1)
Unit Weight (required on all Unconfined Comp. Strength samples)	SS08	P56	1	X	-
Unconfined Comp. Strength	SS10	P54	1	X	-
<b>EMBANKMENT (SHRP SECTIONS)</b>					
<b>TESTING ON BULK SAMPLES</b>					
Sieve Analysis	SS01	P51	7	-	X
Hydrometer to 0.001mm	SS02	P42	7	-	X
Atterberg Limits	SS03	P43	7	-	X
Classification - Bulk samples	SS04	P52	7	-	X
Moisture-Density Relations	SS05	P55	7	-	X
Natural Moisture Content	SS09	P49	7	-	X
<b>TESTING ON THIN-WALL SAMPLES NOTE 1</b>					
Classification - Thin wall (visual manual only)	SS04	P52	15	X (7)	X (8)
Resilient Modulus (Thin wall tubes) Conduct test on bulk sample if thin wall tubes are not test quality (Number of tests = Number of Tube Samples - Number of Additional Samples )	SS07	P46	8	-	X
Unit Weight (required on all Unconfined Comp. Strength samples)	SS08	P56	6	X	-
Unconfined Comp. Strength	SS10	P54	6	X	-
Permeability Note. If thin wall tubes are not test quality conduct test UG09, Protocol P48 using bulk samples (contact SHRP for directions )	SS11	P57	5	X	-
<b>SUBBASE (CONTROL SECTION)</b>					
<b>TESTING ON BULK SAMPLES</b>					
Particle Size Analysis	UG01	P41	1	-	X
Sieve Analysis (washed)	UG02	P41	1	-	X
Atterberg Limits	UG04	P43	1	-	X
Moisture-Density Relations	UG05	P44	1	-	X
Resilient Modulus	UG07	P46	1	-	X
Classification	UG08	P47	1	-	X
Permeability	UG09	P48	1	X	-
Natural Moisture Content	UG10	P49	1	-	X

NOTE 1: A TOTAL OF 33 TUBE SAMPLES WERE OBTAINED. REFER TO TABLE 9 FOR LOCATIONS AND DESIGNATIONS AND TABLES 34, 38 FOR LABORATORY TRACKING TABLES AND INFORMATION REGARDING ADDITIONAL SAMPLES

TABLE 6. LABORATORY MATERIALS TESTING PLAN FOR EACH LAYER (CONTINUED)

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Test Conducted by:	
				State	FHWA
<b>ASPHALT CONCRETE</b>					
<b>TESTING ON CORE SAMPLES</b>					
Core Examination/Thickness	AC01	P01	66	X (42)	X (24)
Bulk Specific Gravity	AC02	P02	168	X (104)	X (64)
Creep Modulus	AC06	P06	3	--	X
Resilient Modulus	AC07	P07	45	--	X
Tensile Strength	AC07	P07	60	--	X
<b>TESTING ON BULK SAMPLES</b>					
Maximum Specific Gravity	AC03	P03	11	X	--
Asphalt Content (Extraction)	AC04	P04	11	X	--
Moisture Susceptibility	AC05	P05	11	X	--
<b>Asphalt Cement (from extracted bulk sample)</b>					
Abson Recovery	AE01	P21	11	X	--
Penetration at 77F and 115F	AE02	P22	11	X	--
Specific Gravity (60F)	AE03	P23	11	X	--
Viscosity at 77F	AE04	P24	11	X	--
Viscosity at 140F, 275F	AE05	P25	11	X	--
<b>Extracted Aggregate (from extracted bulk sample)</b>					
Specific Gravity – Coarse Agg.	AG01	P11	11	X	--
Specific Gravity – Fine Agg.	AG02	P12	11	X	--
Gradation of Aggregate	AG05	P14	11	X	--
NAA Test for Fine Aggregatae	AG05	P14A	11	X	--
<b>Asphalt Cement: (From Tanker)</b>					
Penetration at 77F, 115F	AE02	P22	3	X	--
Specific Gravity (60F)	AE03	P23	3	X	--
Viscosity at 77F	AE04	P24	3	X	--
Viscosity at 140F, 275F	AE05	P25	3	X	--

TABLE 7. SUMMARY OF LABORATORY TESTS BY TYPE OF TEST

Test	Layer	No. of Tests	Test Performed by:		SHRP Test	SHRP Protocol
			State	FHWA		
<b>SUBGRADE (CONTROL SECTION), EMBANKMENT AND AGGREGATE BASE</b>						
Sieve Analysis	Embankment	7	–	7	SS01	P51
Hydrometer to to 0.001 mm	Embankment	7	–	7	SS02	P42
Atterberg Limits	Embankment	7	–	7	SS03	P43
	Subbase	1	–	1	UG04	P43
	Aggregate Base	5	–	5		
Classification – Bulk Samples	Embankment	7	–	7	SS04	P52
	Subbase	1	–	1	UG08	P47
	Aggregate Base	5	–	5		
Classification – Thin Wall Tubes	Subgrade	2	1	1	SS04	P52
	Embankment	15	7	8		
Moisture–Density Relations	Embankment	7	–	7	SS05	P55
	Subbase	1	–	1	UG05	P44
	Aggregate Base	5	–	5		
Resilient Modulus	Subgrade	1	–	1	SS07	P46
	Embankment	8	–	8		
	Subbase	1	–	1	UG07	P46
	Aggregate Base	5	–	5		
Unit Weight	Subgrade	1	1	–	SS08	P56
	Embankment	6	6	–		
Natural Moisture Content	Embankment	7	–	7	SS09	P49
	Subbase	1	–	1	UG10	P49
	Aggregate Base	5	–	5		
Unconfined Comp. Strength	Subgrade	1	1	–	SS10	P54
	Embankment	6	6	–		
Permeability	Subgrade	0	0	–	SS11	P57
	Embankment – NOTE 1	5	5	–		
	Subbase	1	1	–	UG09	P48
	Aggregate Base	5	5	–		
Particle Size Analysis	Subbase	1	–	1	UG01	P41
	Aggregate Base	5	–	5		
Sieve Analysis (washed)	Subbase	1	–	1	UG02	P41
	Aggregate Base	5	–	5		

TABLE 7. SUMMARY OF LABORATORY TESTS BY TYPE OF TEST (CONTINUED)

Test	Layer	No. of Tests	Test Performed by:		SHRP Test Designation	SHRP Protocol
			State	FHWA		
<b>PERMEABLE ASPHALT TREATED BASE, ASPHALT TREATED BASE AND ASPHALT CONCRETE</b>						
Asphalt Content (Extraction)	PATB	5	5	--	AC04	P04
	ATB	4	4	--		
	AC	11	11	--		
Moisture Susceptibility	ATB	2	2	--	AC05	P05
	AC	11	11	--		
Resilient Modulus	ATB	9	--	9	AC07	P07
	AC	45	--	45		
Tensile Strength	ATB	12	--	12	AC07	P07
	AC	60	--	60		
Creep Modulus	AC	3	--	3	AC06	P06
<b>EXTRACTED AGGREGATE</b>						
Specific Gravity - Coarse aggregate	ATB	4	4	--	AG01	P11
	AC	11	11	--		
Specific Gravity - Fine Aggregate	ATB	4	4	--	AG02	P12
	AC	11	11	--		
Gradation of Aggregate	PATB	5	5	--	AG04	P14
	ATB	4	4	--		
	AC	11	11	--		
NAA Test for Fine Aggregate	ATB	4	--	4	AG05	P14A
	AC	11	--	11		
<b>ASPHALT CEMENT (RECOVERED)</b>						
Absorb Recovery	ATB	4	4	--	AE01	P21
	AC	11	11	--		
Penetration at 77°F and 115°F	Recovered from ATB	4	4	--	AE02	P22
	Recovered from AC	11	11	--		
Specific Gravity (60°F)	Recovered from ATB	4	4	--	AE03	P23
	Recovered from AC	11	11	--		
Viscosity at 77°F	Recovered from ATB	4	4	--	AE04	P24
	Recovered from AC	11	11	--		
Viscosity at 140°F and 275°F	Recovered from ATB	4	4	--	AE05	P25
	Recovered from AC	11	11	--		
<b>ASPHALT CEMENT (FROM TANKER)</b>						
Penetration at 77°F and 115°F	(85 - 100 PEN) - ATB, PATB, ASPB	1	1	--	AE02	P22
	(120 - 150 PEN) - AC LAYERS	3	3	--		
Specific Gravity (60°F)	(85 - 100 PEN) - ATB, PATB, ASPB	1	1	--	AE03	P23
	(120 - 150 PEN) - AC LAYERS	3	3	--		
Viscosity at 77°F	(85 - 100 PEN) - ATB, PATB, ASPB	1	1	--	AE04	P24
	(120 - 150 PEN) - AC LAYERS	3	3	--		
Viscosity at 140°F and 275°F	(85 - 100 PEN) - ATB, PATB, ASPB	1	1	--	AE05	P25
	(120 - 150 PEN) - AC LAYERS	3	3	--		

Note 1 - If thin wall tubes are not test quality, perform test UG09, Protocol P48 using the bulk samples  
 If test section from which tube came does not have a bulk sample, contact SHRP for recommended substitution.

**TABLE 8. LOCATIONS FOR BULK SAMPLES AND MOISTURE SAMPLES FROM PREPARED SUBGRADE (CONTROL SECTION ONLY) AND EMBANKMENT (SHRP SECTIONS)**

Sample Designation	Sample Area	Layer	Reference Monitoring Section	Sampling Location from Beginning of Monitoring Section	Offset from Outer Edge of Pavement (ft)
B1	4	Embankment	260120	5 + 55	6
B2	6	Embankment	260118	5 + 50	6
B3	11	Embankment	260123	0 - 50	6
B4	14	Embankment	260122	5 + 50	6
B5	17	Embankment	260114	0 - 50	6
B6	20	Embankment	260119	5 + 50	6
B7	24	Embankment	260115	5 + 50	6

**NOTE: BULK SAMPLES HAVE DESIGNATIONS AS FOLLOWS:**

B1: BS-01, MS-01; B2: BS-02, MS-02; B3: BS-03, MS-03; B4: BS-04, MS-04;  
 B5: BS-05, MS-05; B6: BS-06, MS-06; B7: BS-07, MS-07

TABLE 9. LOCATIONS FOR SHELBY TUBE AND SPLIT SPOONSAMPLING FROM SUBGRADE (CONTROL SECTION) AND EMBANKMENT (SHRP SECTIONS)

Location Designation	Depth (ft)	Sample Designation	Sample Type	Monitoring Section Number	Layer	Sampling Location from Beginning of Monitoring Section	Offset from Outer Edge of Pavement (ft)
A1	0 - 2	A1#1 = TS-01	Thinwall	260121	Embankment	0+95	8
A1	2 - 4	A1#2 = TS-02	Thinwall	260121	Embankment	0+95	8
A2	0 - 2	A2#1 = TS-03	Thinwall	260121	Embankment	2+45	8
A2	2 - 4	A2#2 = TS-04	Thinwall	260121	Embankment	2+45	8
A3	0 - 2	SS-01	Splitspoon	260121	Embankment	3+95	8
A3	2 - 4	A3#2 = TS-05	Thinwall	260121	Embankment	3+95	8
A4	0 - 2	SS-02	Splitspoon	260118	Embankment	1+10	8
A4	2 - 4	A4#2 = TS-06	Thinwall	260118	Embankment	1+10	8
A5	0 - 2	SS-03	Splitspoon	260118	Embankment	2+45	8
A5	2 - 4	A5#2 = TS-07	Thinwall	260118	Embankment	2+45	8
A6	0 - 2	A6#1 = TS-08	Thinwall	260118	Embankment	3+95	8
A6	2 - 4	A6#2 = TS-09	Thinwall	260118	Embankment	3+95	8
A7*	A7 - A9 LOCATIONS WERE NOT SAMPLED			260124	Embankment	1+00	8
A8*				260124	Embankment	2+50	8
A9*				260124	Embankment	4+00	8
A10	0 - 2	SS-04	Splitspoon	260123	Embankment	1+00	8
A10	2 - 4	A10#2 = TS-10	Thinwall	260123	Embankment	1+00	8
A11	0 - 2	SS-05	Splitspoon	260123	Embankment	2+50	8
A11	2 - 4	A11#2 = TS-11	Thinwall	260123	Embankment	2+50	8
A12	0 - 2	A12#1 = TS-12	Thinwall	260123	Embankment	4+00	8
A12	2 - 4	A12#2 = TS-13	Thinwall	260123	Embankment	4+00	8
A13	0 - 2	A13#1 = TS-14	Thinwall	260122	Embankment	1+00	8
A13	2 - 4	A13#2 = TS-15	Thinwall	260122	Embankment	1+00	8
A14	0 - 2	A14#1 = TS-16	Thinwall	260122	Embankment	2+50	8
A14	2 - 4	A14#2 = TS-17	Thinwall	260122	Embankment	2+50	8
A15	0 - 2	A15#1 = TS-18	Thinwall	260122	Embankment	4+00	8
A15	2 - 4	A15#2 = TS-19	Thinwall	260122	Embankment	4+00	8

TABLE 9. LOCATIONS FOR SHELBY TUBE AND SPLIT SPOONSAMPLING FROM SUBGRADE (CONTROL SECTION) AND EMBANKMENT (SHRP SECTIONS) CONTINUED

Location Designation	Depth (ft)	Sample Designation	Sample Type	Monitoring Section Number	Layer	Sampling Location from Beginning of Monitoring Section	Offset from Outer Edge of Pavement (ft)
A16	0 - 2	A16#1 = TS-20	Thinwall	260114	Embankment	1+00	8
A16	2 - 4	A16#2 = TS-21	Thinwall	260114	Embankment	1+00	8
A17	0 - 2	A17#1 = TS-22	Thinwall	260114	Embankment	2+50	8
A17	2 - 4	A17#2 = TS-23	Thinwall	260114	Embankment	2+50	8
A18	0 - 2	A18#1 = TS-24	Thinwall	260114	Embankment	4+00	8
A18	2 - 4	A18#2 = TS-25	Thinwall	260114	Embankment	4+00	8
A19	0 - 2	A19#1 = TS-29	Thinwall	260117	Embankment	1+00	8
A19	2 - 4	A19#2 = TS-30	Thinwall	260117	Embankment	1+00	8
A20	0 - 2	A20#1 = TS-31	Thinwall	260117	Embankment	2+50	8
A20	2 - 4	A20#2 = TS-32	Thinwall	260117	Embankment	2+50	8
A21	0 - 2	SS-08	Splitspoon	260117	Embankment	4+00	8
A21	2 - 4	A21#2 = TS-33	Thinwall	260117	Embankment	4+00	8
A22	0 - 2	SS-06	Splitspoon	260159	Subgrade	1+00	8
A22	2 - 4	A22#2 = TS-26	Thinwall	260159	Subgrade	1+00	8
A23	0 - 2	SS-07	Splitspoon	260159	Subgrade	2+50	8
A23	2 - 4	A23#2 = TS-27	Thinwall	260159	Subgrade	2+50	8
A24	0 - 2	SS-08	Splitspoon	260159	Subgrade	4+00	8
A24	2 - 4	A24#2 = TS-28	Thinwall	260159	Subgrade	4+00	8

**TABLE 10. FIELD AND LABORATORY TEST PLAN FOR EMBANKMENT**

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
<b>FIELD TESTS</b>						
In-Place Density & Moisture	-	Section 3.3.14 Reference 3	43	T1-T42, T46	X	-
Depth to Rigid Layer	-	Section 3.8 Reference 2	6	S1-S5, S7	X	-
Elevation Measurements	-	Section 5.3.2 of this Report	65 per Section	See Section 5.2.2 and Table 13 of this Report	X	-
FWD Testing	-	P59	25 per Section	See Section 5.2.2 and Table 15 of this Report	X	-
<b>LABORATORY TESTS</b>						
Sieve Analysis	SS01	P51	7	B1-B7	-	X
Hydrometer to 0.001mm	SS02	P42	7	B1-B7	-	X
Atterberg Limits	SS03	P43	7	B1-B7	-	X
Classification	SS04	P52	7	B1-B7	-	X
			15	PERFORM ON ALL TESTED THIN-WALL SAMPLES (NOTE 1)	X (7)	X (8)
Moisture-Density Relations	SS05	P55	7	B1-B7	-	X
Resilient Modulus	SS07	P46	8	A1(#1), A4(#2), A12(#1), A14(#1), A15(#1), A16(#1), A18(#1) A20(#1) NOTES 2, 3	-	X
				A2(#1), A6(#1), A11(#2), A13(#1), A17(#1), A19(#1) NOTES 2, 4	-	X
Unit Weight	SS08	P56	6	A2(#1), A6(#1), A11(#2), A13(#1), A17(#1), A19(#1) NOTES 2, 4	X	-
Natural Moisture Content	SS09	P49	7	B1-B7	-	X
Unconfined Comp. Strength	SS10	P54	6	A2(#1), A6(#1), A11(#2), A13(#1), A17(#1), A19(#1) NOTES 2, 4	X	-
Permeability	SS11	P57	5	A6(#1), A11(#2), A13(#1), A17(#1), A19(#2) NOTE 5	X	-
<p>NOTE 1. VISUAL-MANUAL CLASSIFICATION ONLY DO NOT PERFORM ON ADDITIONAL SAMPLES UNLESS TESTED TO PRESERVE SAMPLE INTEGRITY</p> <p>NOTE 2 THIN WALL SAMPLES HAVE THE FOLLOWING DESIGNATIONS EXAMPLE - LOCATION A1 A1#1 = SAMPLE FROM 0' - 2', A1#2 = SAMPLE FROM 2' TO 4' REFER TO TABLE 9 FOR SAMPLING DATA SHEETS FOR SHRP DESIGNATIONS, ONLY THE TUBES HAVE THE A1#2 TYPE DESIGNATION CODED ON THEM</p> <p>NOTE 3 ADDITIONAL SAMPLES ARE SHOWN ON LABORATORY TRACKING TABLE 38 USE ADDITIONAL SAMPLES FOR REQUIRED TESTS IF NECESSARY</p> <p>NOTE 4 ADDITIONAL SAMPLES ARE SHOWN ON LABORATORY TRACKING TABLE 34 USE ADDITIONAL SAMPLES FOR REQUIRED TESTS IF NECESSARY</p> <p>NOTE 5 PERMEABILITY TEST TAKES PREFERENCE OVER UNCONFINED COMPRESSIVE STRENGTH, FOR THOSE TUBES WHICH ARE DESIGNATED FOR BOTH TESTS USE ADDITIONAL SAMPLE FROM SAME LOCATION IF NECESSARY</p>						

TABLE 11. FIELD AND LABORATORY TEST PLAN FOR SUBGRADE (CONTROL SECTION ONLY)

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by	
					State	FHWA
<b>FIELD TESTS</b>						
In-Place Density & Moisture	–	Section 3.3.14 Reference 3	3	T43 – T45	X	–
Elevation Measurements	–	Section 5.2.2 of this Report	55	See Section 5.2.2 and Table 13 of this Report	X	–
FWD Testing	–	P59	25	See Section 5.2.2 and Table 15 of this Report	X	–
Depth to Rigid Layer	–	Section 3.8 Reference 2	1	S6		
<b>LABORATORY TESTS</b>						
Classification	SS04	P52	2	A22(2), A23(#2) NOTE 1	X (1)	X (1)
Resilient Modulus	SS07	P46	1	A22(#2) NOTE 2, 3	–	X
Unit Weight	SS08	P56	1	A23(#2) NOTE 2	X	–
Unconfined Comp. Strength	SS10	P54	1	A23(#2) NOTE 2	X	–
Permeability	SS11	P57	0	NOT TESTED	X	–
<p>NOTE 1: VISUAL – MANUAL CLASSIFICATION ONLY DO NOT CONDUCT ON ADDITIONAL SAMPLE UNLESS USED FOR TESTING.</p> <p>NOTE 2 THIN WALL SAMPLES HAVE THE FOLLOWING DESIGNATIONS EXAMPLE – LOCATION A22, A22#2 = SAMPLE FROM 2' TO 4', SPLITSPOON SAMPLE WAS RETRIEVED FROM 0' TO 2'</p> <p>REFER TO TABLE 9 FOR SAMPLING DATA SHEETS FOR SHRP DESIGNATIONS, ONLY THE TUBES HAVE THE A22#2 DESIGNATION CODED ON THEM</p> <p>NOTE 3 ADDITIONAL SAMPLES ARE SHOWN ON LABORATORY TRACKING TABLE 38 USE ADDITIONAL SAMPLES FOR REQUIRED TESTS IF NECESSARY</p>						

TABLE 12. LOCATIONS FOR IN-PLACE DENSITY AND MOISTURE TESTS ON PREPARED SUBGRADE (CONTROL SECTION) AND EMBANKMENT (SHRP SECTIONS)

Test Location Designation	Monitoring Section Number	Layer	Test Location from Beginning of Monitoring Section	Offset from Outer Edge of Pavement (ft)
T1	260121	Embankment	0 + 95	6
T2	260121	Embankment	2 + 45	6
T3	260121	Embankment	3 + 95	6
T4	260120	Embankment	1 + 00	6
T5	260120	Embankment	2 + 50	6
T6	260120	Embankment	4 + 00	6
T7	260120	Embankment	Bulk Sample – B1: 5+55	6
T8	260118	Embankment	1 + 10	6
T9	260118	Embankment	2 + 45	6
T10	260118	Embankment	3 + 95	6
T14	260118	Embankment	Bulk Sample – B2: 5+50	6
T11	260116	Embankment	1 + 00	6
T12	260116	Embankment	2 + 50	6
T13	260116	Embankment	4 + 00	6
T15	260124	Embankment	1 + 00	6
T16	260124	Embankment	2 + 50	6
T17	260124	Embankment	4 + 00	6
T21	260123	Embankment	Bulk Sample – B3: 0 – 50	6
T18	260123	Embankment	1 + 00	6
T19	260123	Embankment	2 + 50	6
T20	260123	Embankment	4 + 00	6
T22	260122	Embankment	1 + 00	6
T23	260122	Embankment	2 + 50	6
T24	260122	Embankment	4 + 00	6
T25	260122	Embankment	Bulk Sample – B4: 5 + 50	6
T26	260113	Embankment	1 + 00	6
T27	260113	Embankment	2 + 50	6
T28	260113	Embankment	4 + 00	6
T35	260114	Embankment	Bulk Sample – B5: 0 – 50	6
T29	260114	Embankment	1 + 00	6
T30	260114	Embankment	2 + 50	6
T31	260114	Embankment	4 + 00	6
T32	260119	Embankment	1 + 00	6
T33	260119	Embankment	2 + 50	6
T34	260119	Embankment	4 + 00	6
T42	260119	Embankment	Bulk Sample – B6: 5 + 50	6
T36	260117	Embankment	1 + 00	6
T37	260117	Embankment	2 + 50	6
T38	260117	Embankment	4 + 00	6
T39	260115	Embankment	1 + 00	6
T40	260115	Embankment	2 + 50	6
T41	260115	Embankment	4 + 00	6
T46	260115	Embankment	Bulk Sample – B7: 5+50	6
T43	260159	Subgrade	1 + 00	6
T44	260159	Subgrade	2 + 50	6
T45	260159	Subgrade	4 + 00	6

TABLE 13. LOCATIONS FOR ELEVATION MEASUREMENTS

Distance from Beginning of Monitoring Section	Locations for Elevation Measurements Offset from Outer Edge of Pavement (ft)				
	0	3	6	9	12
0-25	0	3	6	9	12
0+00	0	3	6	9	12
0+50	0	3	6	9	12
1+00	0	3	6	9	12
1+50	0	3	6	9	12
2+00	0	3	6	9	12
2+50	0	3	6	9	12
3+00	0	3	6	9	12
3+50	0	3	6	9	12
4+00	0	3	6	9	12
4+50	0	3	6	9	12
5+00	0	3	6	9	12
5+25	0	3	6	9	12

TABLE 14. LOCATIONS FOR 20 FT SHOULDER PROBES

Probe Location Designation	Monitoring Section Number	Test Location from Beginning of Monitoring Section
S1	260121	2+50
S2	260118	2+50
S3	260124	2+50
S4	260122	2+50
S5	260114	2+50
S6	260159	2+50
S7	260115	2+50

TABLE 15. LOCATIONS FOR FWD TESTS

Path	Test Location from Beginning of Monitoring Section	Offset from Outer Edge of Pavement (ft)
Outer Wheelpath	0-25	2.5 ± 0.5
	0+00	2.5 ± 0.5
	0+50	2.5 ± 0.5
	1+00	2.5 ± 0.5
	1+50	2.5 ± 0.5
	2+00	2.5 ± 0.5
	2+50	2.5 ± 0.5
	3+00	2.5 ± 0.5
	3+50	2.5 ± 0.5
	4+00	2.5 ± 0.5
	4+50	2.5 ± 0.5
	5+00	2.5 ± 0.5
	5+25	2.5 ± 0.5
Mid-Lane	0-25	6 ± 0.5
	0+25	6 ± 0.5
	0+75	6 ± 0.5
	1+25	6 ± 0.5
	1+75	6 ± 0.5
	2+25	6 ± 0.5
	2+75	6 ± 0.5
	3+25	6 ± 0.5
	3+75	6 ± 0.5
	4+25	6 ± 0.5
	4+75	6 ± 0.5
	5+25	6 ± 0.5

TABLE 16. FIELD AND LABORATORY TEST PLAN FOR SUBBASE (CONTROL SECTION ONLY)

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
<b>FIELD TESTS</b>						
In-Place Density & Moisture	–	Section 3.3.14 Reference 3	4	T47 – T49, T74	X	–
Elevation Measurements	–	Section 5.3.2 of this report	65 per Section	See Section 5.3.2 and Table 13 of this Report	X	–
FWD Testing	–	P59	25 per Section	See Section 5.3.2 and Table 15 of this Report	X	–
<b>LABORATORY TESTS</b>						
Particle Size Analysis	UG01	P41	1	B8	–	X
Sieve Analysis (washed)	UG02	P41	1	B8	–	X
Atterberg Limits	UG04	P43	1	B8	–	X
Moisture – Density Relations	UG05	P44	1	B8	–	X
Resilient Modulus	UG07	P46	1	B8	–	X
Classification	UG08	P47	1	B8	–	X
Permeability	UG09	P48	1	B8	X	–
Natural Moisture Content	UG10	P49	1	B8	–	X

**TABLE 17. LOCATIONS FOR BULK SAMPLES AND MOISTURE SAMPLES FROM SUBBASE (CONTROL SECTION) AND DENSE GRADED AGGREGATE BASE (SHRP SECTIONS)**

Sample Designation NOTE 1	Sample Area	Layer	Sampling Location from Beginning of Monitoring Section	Reference Monitoring Section
B8	26	Subbase	5 + 30	260159
B9	1	Agg. Base	0 - 30	260121
B10	5	Agg. Base	0 - 30	260118
B11	15	Agg. Base	0 - 30	260113
B12	18	Agg. Base	5 + 30	260114
B13	25	Agg. Base	0 - 30	260159

NOTE 1: SAMPLE DESIGNATION (SUBBASE) HAS CODING BG-05, MG-05. DGAB CODING B9 = BG-01, MG-01; B10 = BG-02, MG-02; B11 = BG-03, MG-03; B12 = BG-04, MG-04; B13 = BG-06, MG-06

TABLE 18. FIELD AND LABORATORY TEST PLAN FOR DENSE GRADED AGGREGATE BASE MATERIALS

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
<b>FIELD TESTS</b>						
In-Place Density & Moisture	–	Section 3.3.14 Reference 3	29	T50–T73, T75–T79	X	–
Elevation Measurements	–	Section 5.4.2 of this report	65 per Section	See Section 5.4.2 and Table 13 of this Report	X	–
FWD Testing	–	P59	25 per Section	See Section 5.4.2 and Table 15 of this Report	X	–
<b>LABORATORY TESTS</b>						
Particle Size Analysis	UG01	P41	5	B9 – B13	–	X
Sieve Analysis (washed)	UG02	P41	5	B9 – B13	–	X
Atterberg Limits	UG04	P43	5	B9 – B13	–	X
Moisture–Density Relations	UG05	P44	5	B9 – B13	–	X
Resilient Modulus	UG07	P46	5	B9 – B13	–	X
Classification	UG08	P47	5	B9 – B13	–	X
Permeability	UG09	P48	5	B9 – B13	X	–
Natural Moisture Content	UG10	P49	5	B9 – B13	–	X

TABLE 19. LOCATIONS FOR IN-PLACE DENSITY AND MOISTURE TESTS ON COMPACTED SUBBASE (CONTROL SECTION) AND COMPACTED AGGREGATE BASE (SHRP SECTIONS)

Test Location Designation	Layer	Monitoring Section Number	Test Location from Beginning of Monitoring Section	Offset from Outer Edge of Pavement (ft)
T47	Subbase	260159	1 + 00	6
T48	Subbase	260159	2 + 50	6
T49	Subbase	260159	4 + 00	6
T50	Agg. Base	260121	1 + 00	6
T51	Agg. Base	260121	2 + 50	6
T52	Agg. Base	260121	4 + 00	6
T53	Agg. Base	260120	1 + 00	6
T54	Agg. Base	260120	2 + 50	6
T55	Agg. Base	260120	4 + 00	6
T56	Agg. Base	260118	1 + 00	6
T57	Agg. Base	260118	2 + 50	6
T58	Agg. Base	260118	4 + 00	6
T59	Agg. Base	260113	1 + 00	6
T60	Agg. Base	260113	2 + 50	6
T61	Agg. Base	260113	4 + 00	6
T62	Agg. Base	260114	1 + 00	6
T63	Agg. Base	260114	2 + 50	6
T64	Agg. Base	260114	4 + 00	6
T65	Agg. Base	260119	1 + 00	6
T66	Agg. Base	260119	2 + 50	6
T67	Agg. Base	260119	4 + 00	6
T68	Agg. Base	260117	1 + 00	6
T69	Agg. Base	260117	2 + 50	6
T70	Agg. Base	260117	4 + 00	6
T71	Agg. Base	260159	1 + 00	6
T72	Agg. Base	260159	2 + 50	6
T73	Agg. Base	260159	4 + 00	6
T74	Subbase	260159	Bulk Sampling Location B8: 5+30, 6' OFFSET	
T75	Agg. Base	260121	Bulk Sampling Location B9: 0 - 30, 6' OFFSET	
T76	Agg. Base	260118	Bulk Sampling Location B10: 0 - 30, 6' OFFSET	
T77	Agg. Base	260113	Bulk Sampling Location B11: 0 - 30, 6' OFFSET	
T78	Agg. Base	260114	Bulk Sampling Location B12: 5 + 30, 6' OFFSET	
T79	Agg. Base	260159	Bulk Sampling Location B13: 0 - 30, 6' OFFSET	

**TABLE 20. LOCATIONS FOR BULK SAMPLING OF PERMEABLE ASPHALT TREATED BASE MATERIAL (PATB)**

Uncompacted PATB Sample Location (NOTE 1, 2)	Sample Area	Location from Beginning of Monitoring Section	Reference Monitoring Section
BP-01	4	5 + 30	260120
BP-02	11	0 - 30	260123
BP-03	13	0 - 30	260122
BP-04	19	0 - 30	260119
BP-05	25	0 - 30	260159

**NOTE 1:** Sample from the haul vehicle for the mix to be placed at the specified locations.

**NOTE 2:** BP-01 LOCATION HAS SAMPLE DESIGNATION BT-01, BP-02 = BT-02, BP-03 = BT-03  
BP-04 = BT-04, BP-05 = BT-05

TABLE 21. FIELD AND LABORATORY TEST PLAN FOR PERMEABLE ASPHALT TREATED BASE

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
<b>FIELD TESTS</b>						
Elevation Measurements	–	See Section 5.5.1 of this Report	65 per Section	See Section 5.5.2 and Table 13 of this Report	X	–
Falling Weight Deflectometer Tests	–	P59	25 per Section	See Section 5.5.2 and Table 15 of this Report	X	–
<b>LABORATORY TESTS</b>						
Asphalt Content (Extraction)	AC04	P04	5	BP–01, BP–02, BP–03, BP–04, BP–05	X	–
<b>Extracted Aggregate</b>						
Gradation of Aggregate	AG05	P14	5	BP–01, BP–02, BP–03, BP–04, BP–05	X	–

**TABLE 22. LOCATIONS FOR BULK SAMPLING OF ASPHALT TREATED BASE MATERIAL**

Uncompacted ATB Sample Location (NOTE 1, 2)	Sample Area	Location from Beginning of Monitoring Section	Reference Monitoring Section
BT-1	5	0 - 30	260118
BT-2	11	0 - 30	260123
BT-3	13	0 - 30	260122
BT-4	24	5 + 30	260115

NOTE 1: Sample from the haul vehicle for the mix to be placed at the given locations.

NOTE 2: BT-1 LOCATION HAS SAMPLE DESIGNATION BT-20, BT-2 = BT-21  
BT-3 = BT22, BT-4 = BT23

**TABLE 23. CORING LOCATIONS FOR ASPHALT TREATED BASE**

Core Number	Sample Area	Core Location from Beginning of Monitoring Section	Reference Monitoring Section
C11	5	0-25	260118
C12	5	0-25	260118
C13	5	0-25	260118
C14	5	0-25	260118
C15	6	5+25	260118
C16	6	5+25	260118
C17	7	0-25	260116
C18	7	0-25	260116
C19	8	5+25	260116
C20	8	5+25	260116
C21	9	0-25	260124
C22	9	0-25	260124
C23	10	5+25	260124
C24	10	5+25	260124
C25	11	0-25	260123
C26	11	0-25	260123
C27	12	5+25	260123
C28	12	5+25	260123
C29	13	0-25	260122
C30	13	0-25	260122
C31	13	0-25	260122
C32	13	0-25	260122
C33	14	5+25	260122
C34	14	5+25	260122
C51	21	0-25	260117
C52	21	0-25	260117
C53	22	5+25	260117
C54	22	5+25	260117
C55	23	0-25	260115
C56	23	0-25	260115
C57	23	0-25	260115
C58	23	0-25	260115
C59	24	5+25	260115
C60	24	5+25	260115

**NOTE: Refer to Table 27 for the Offsets to Cores from the Outer Edge of the Pavement**

TABLE 24. FIELD AND LABORATORY TEST PLAN FOR ASPHALT TREATED BASE

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
<b>FIELD TESTS</b>						
Nuclear Density Tests	–	Section 3.3.14 Reference 3	21	D1 – D21	X	–
Elevation Measurements	–	See Section 5.6.2 of this Report	65 per Section	See Section 5.6.2 and Table 13 of this Report	X	–
Falling Weight Deflectometer Tests	P59	See Section 5.6.2 of this Report	25 per Section	See Section 5.6.2 and Table 13 of this Report	X	–
<b>LABORATORY TESTS</b>						
Core Examination/Thickness	AC01	P01	34	C11–C34, C51–C60	X (22)	X (12)
Bulk Specific Gravity	AC02	P02	34	C11–C34, C51–C60	X (22)	X (12)
Maximum Specific Gravity	AC03	P03	4	BT–1, BT–2, BT–3, BT–4	X	–
Asphalt Content (Extraction)	AC04	P04	4	BT–1, BT–2, BT–3, BT–4	X	–
Moisture Susceptibility	AC05	P05	4	BT–1, BT–2, BT–3, BT–4	X	–
Resilient Modulus	AC07	P07	9	C11–C13, C29–C31, C55–57	–	X
Tensile Strength	AC07	P07	12	C11–C14, C29–C32, C55–58	–	X
<b>Extracted Aggregate</b>						
Specific Gravity – Coarse Agg.	AG01	P11	4	BT–1, BT–2, BT–3, BT–4	X	–
Specific Gravity – Fine Agg.	AG02	P12	4	BT–1, BT–2, BT–3, BT–4	X	–
Gradation of Aggregate	AG05	P14	4	BT–1, BT–2, BT–3, BT–4	X	–
NAA Test for Fine Aggregate	AG05	P14A	4	BT–1, BT–2, BT–3, BT–4	X	–
<b>Asphalt Cement (Extracted)</b>						
Abson Recovery	AE01	P21	4	BT–1, BT–2, BT–3, BT–4	X	–
Penetration at 77°F, 115°F	AE02	P22	4	BT–1, BT–2, BT–3, BT–4	X	–
Specific Gravity (60°F)	AE03	P23	4	BT–1, BT–2, BT–3, BT–4	X	–
Viscosity at 77°F	AE04	P24	4	BT–1, BT–2, BT–3, BT–4	X	–
Viscosity at 140°F, 275°F	AE05	P25	4	BT–1, BT–2, BT–3, BT–4	X	–
<b>Asphalt Cement (From Plant)</b>						
Penetration at 77°F, 115°F	AE02	P22	1	BC–01	X	–
Specific Gravity (60°F)	AE03	P23	1	BC–01	X	–
Viscosity at 77°F	AE04	P24	1	BC–01	X	–
Viscosity at 140°F, 275°F	AE05	P25	1	BC–01	X	–

TABLE 25. LOCATION OF NUCLEAR DENSITY TESTS ON ASPHALT TREATED BASE

Test Number	Monitoring Section	Test Location from Beginning of Monitoring Section	Offset from Outer Edge of Pavement (ft)
D1	260118	1+00	6
D2	260118	2+50	8.5
D3	260118	3+96	8
D4	260116	1+00	7.5
D5	260116	2+50	7
D6	260116	4+00	7
D7	260124	1+00	6.5
D8	260124	2+50	6.5
D9	260124	4+00	6.5
D10	260123	1+00	6
D11	260123	2+50	6
D12	260123	4+00	6
D13	260122	1+00	6
D14	260122	2+50	6
D15	260122	4+00	6
D16	260117	1+00	6
D17	260117	2+50	6
D18	260117	4+00	6
D19	260115	1+00	6
D20	260115	2+50	6
D21	260115	4+00	6

TABLE 26. LOCATIONS FOR BULK SAMPLING OF ASPHALT CONCRETE AND ASPHALT CEMENT

Asphalt Concrete Sampling Location (Note 1)	Sampling Area	Location from Beginning of Monitoring Section	Reference Monitoring Section	Number of Asphalt Concrete Layers	Asphalt Cement Sample Required? (see Note 2)	Bulk Asphalt Concrete Sample Designation (See Note 1)	Asphalt Cement Sample Designation (see Note 2)
BA-01	2	5 + 30	260121	2	Yes	BA-01 (1st Layer leveling 3C), BA-02 (Surface 4C)	BC-02
BA-02	10	5 + 30	260124	3	Yes	BA-03 (1st Layer leveling 2C), BA-04 (2nd Layer leveling 3C), BA-05 (surface 4C)	BC-03
BA-03	18	5 + 30	260114	3	Yes	BA-06 (1st Layer Leveling 2C), BA-07 (2nd Layer leveling 3C), BA-08 (surface 4C)	BC-04
BA-04	22	5 + 30	260117	3	No	BA-09 (1st Layer Leveling 2C), BA-10 (2nd Layer leveling 3C), BA-11 (surface 4C)	--
<p>NOTE 1: Take samples of uncompacted asphalt concrete from the haul vehicle for the mix to be placed at the given locations. Samples shall be obtained from the different asphalt concrete layers placed at the specified locations.</p> <p>NOTE 2: Obtain a sample of 5 gallons of asphalt cement used in the asphalt concrete mix</p>							

TABLE 27. LOCATIONS FOR ASPHALT CONCRETE CORES

Core Number	Sample Area	Core Location from Beginning of Monitoring Section	Reference Monitoring Section	Offset from Outer Edge of Pavement (ft)	Core from ATB ?
C1	1	0-25	260121	3	-
C2	1	0-25	260121	6	-
C3	2	5+25	260121	3	-
C4	2	5+25	260121	6	-
C5	3	0-25	260120	3	-
C6	3	0-25	260120	4½	-
C7	3	0-25	260120	6	-
C8	3	0-25	260120	7½	-
C9	4	5+25	260120	3	-
C10	4	5+25	260120	6	-
C11	5	0-25	260118	3	Yes
C12	5	0-25	260118	4½	Yes
C13	5	0-25	260118	6	Yes
C14	5	0-25	260118	7½	Yes
C15	6	5+25	260118	3	Yes
C16	6	5+25	260118	6	Yes
C17	7	0-25	260116	3	Yes
C18	7	0-25	260116	6	Yes
C19	8	5+25	260116	3	Yes
C20	8	5+25	260116	6	Yes
C21	9	0-25	260124	3	Yes
C22	9	0-25	260124	6	Yes
C23	10	5+25	260124	3	Yes
C24	10	5+25	260124	6	Yes
C25	11	0-25	260123	3	Yes
C26	11	0-25	260123	6	Yes
C27	12	5+25	260123	3	Yes
C28	12	5+25	260123	6	Yes
C29	13	0-25	260122	3	Yes
C30	13	0-25	260122	4½	Yes
C31	13	0-25	260122	6	Yes
C32	13	0-25	260122	7½	Yes
C33	14	5+25	260122	3	Yes
C34	14	5+25	260122	6	Yes
C35	15	0-25	260113	3	-
C36	15	0-25	260113	6	-
C37	16	5+25	260113	3	-
C38	16	5+25	260113	6	-
C39	17	0-25	260114	3	-
C40	17	0-25	260114	4½	-
C41	17	0-25	260114	6	-
C42	17	0-25	260114	7½	-
C43	18	5+25	260114	3	-
C44	18	5+25	260114	6	-
C45	19	0-25	260119	3	-
C46	19	0-25	260119	4½	-
C47	19	0-25	260119	6	-
C48	19	0-25	260119	7½	-
C49	20	5+10	260119	3	-

TABLE 28. FIELD AND LABORATORY TEST PLAN FOR ASPHALT CONCRETE

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
<b>FIELD TESTS</b>						
Nuclear Density Tests	–	Section 3.3.14 Reference 3	99	See Table 29	X	–
Elevation Measurements	–	See Section 5.7.2 of this Report	55 per Section	See Section 5.7.2 and Table 13 of this Report	X	–
<b>LABORATORY TESTS</b>						
Core Examination/Thickness	AC01	P01	66	C1–C66	X (42)	X (24)
Bulk Specific Gravity	AC02	P02	168	C1–C66 (When cores are sawed to separate samples according to different mix types, there will be 168 samples)	X (104)	X (64)
Maximum Specific Gravity	AC03	P03	11	BA–01 (3C), BA–02 (4C)	X	–
				BA–03 (2C), BA–04 (3C), BA–05 (4C)		
				BA–06 (2C), BA–07 (3C), BA–08 (4C)		
				BA–09 (2C), BA–10 (3C), BA–11 (4C)		
Asphalt Content (Extraction)	AC04	P04	11	BA–01 (3C), BA–02 (4C)	X	–
				BA–03 (2C), BA–04 (3C), BA–05 (4C)		
				BA–06 (2C), BA–07 (3C), BA–08 (4C)		
				BA–09 (2C), BA–10 (3C), BA–11 (4C)		
Moisture Susceptibility	AC05	P05	11	BA–01 (3C), BA–02 (4C)	X	–
				BA–03 (2C), BA–04 (3C), BA–05 (4C)		
				BA–06 (2C), BA–07 (3C), BA–08 (4C)		
				BA–09 (2C), BA–10 (3C), BA–11 (4C)		
Creep Modulus (NOTE 1)	AC06	P06	3	C3 (C3L1, C3S), C23 (C23L1, C23L2, C23S), C50 (C50L1, C50L2, C50S)	–	X
Resilient Modulus (NOTE 1)	AC07	P07	45	C5–C7 (C5L1, C6L1, C7L1, C5S, C6S, C7S)	–	X
				C11–C13 (C11L1, C12L1, C13L1, C11S, C12S, C13S)		
				C29–C31 (C29L1, C30L1, C31L1, C29S, C30S, C31S)		
				C39–C41 (C39L1, C40L1, C41L1, C39L2, C40L2, C41L2, C39S, C40S, C41S)		
				C55–C57 (C55L1, C56L1, C57L1, C55L2, C56L2, C57L2, C55S, C56S, C57S)		
				C61–C63 (C61L1, C62L1, C63L1, C61L2, C62L2, C63L2, C61S, C62S, C63S)		

TABLE 28. FIELD AND LABORATORY TEST PLAN FOR ASPHALT CONCRETE (CONTINUED)

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location	Test Conducted by:							
					State	FHWA						
Tensile Strength (NOTE 1)	AC07	P07	60	C5–C8 (C5L1, C6L1, C7L1, C8L1, C5S, C6S, C7S, C8S)	–	X						
				C11–C14 (C11L1, C12L1, C13L1, C14L1, C11S, C12S, C13S, C14S)								
				C29–C32 (C29L1, C30L1, C31L1, C32L1, C29S, C30S, C31S, C32S)								
				C39–C42 (C39L1, C40L1, C41L1, C42L1, C39L2, C40L2, C41L2, C42L2, C39S, C40S, C41S, C42S)								
				C55–C58 (C55L1, C56L1, C57L1, C58L1, C55L2, C56L2, C57L2, C58L2, C55S, C56S, C57S, C58S)								
				C61–C64 (C61L1, C62L1, C63L1, C64L1, C61L2, C62L2, C63L2, C64L2, C61S, C62S, C63S, C64S)								
				<b>Extracted Aggregate</b>								
				Specific Gravity – Coarse Agg.			AG01	P11	11	BA–01 (3C), BA–02 (4C)	X	–
BA–03 (2C), BA–04 (3C), BA–05 (4C)												
BA–06 (2C), BA–07 (3C), BA–08 (4C)												
BA–09 (2C), BA–10 (3C), BA–11 (4C)												
Specific Gravity – Fine Agg.	AG02	P12	11	BA–01 (3C), BA–02 (4C)	X	–						
				BA–03 (2C), BA–04 (3C), BA–05 (4C)								
				BA–06 (2C), BA–07 (3C), BA–08 (4C)								
				BA–09 (2C), BA–10 (3C), BA–11 (4C)								
Gradation of Aggregate	AG05	P14	11	BA–01 (3C), BA–02 (4C)	X	–						
				BA–03 (2C), BA–04 (3C), BA–05 (4C)								
				BA–06 (2C), BA–07 (3C), BA–08 (4C)								
				BA–09 (2C), BA–10 (3C), BA–11 (4C)								
NAA Test for Fine Aggregatae	AG05	P14A	11	BA–01 (3C), BA–02 (4C)	X	–						
				BA–03 (2C), BA–04 (3C), BA–05 (4C)								
				BA–06 (2C), BA–07 (3C), BA–08 (4C)								
				BA–09 (2C), BA–10 (3C), BA–11 (4C)								

TABLE 28. FIELD AND LABORATORY TEST PLAN FOR ASPHALT CONCRETE (CONTINUED)

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
<b>Asphalt Cement</b>						
Absorption Recovery	AE01	P21	11	BA-01 (3C), BA-02 (4C)	X	-
				BA-03 (2C), BA-04 (3C), BA-05 (4C)		
				BA-06 (2C), BA-07 (3C), BA-08 (4C)		
				BA-09 (2C), BA-10 (3C), BA-11 (4C)		
Penetration at 77°F, 115°F	AE02	P22	11	BA-01 (3C), BA-02 (4C)	X	-
				BA-03 (2C), BA-04 (3C), BA-05 (4C)		
				BA-06 (2C), BA-07 (3C), BA-08 (4C)		
				BA-09 (2C), BA-10 (3C), BA-11 (4C)		
Specific Gravity (60°F)	AE03	P23	11	BA-01 (3C), BA-02 (4C)	X	-
				BA-03 (2C), BA-04 (3C), BA-05 (4C)		
				BA-06 (2C), BA-07 (3C), BA-08 (4C)		
				BA-09 (2C), BA-10 (3C), BA-11 (4C)		
Viscosity at 77°F	AE04	P24	11	BA-01 (3C), BA-02 (4C)	X	-
				BA-03 (2C), BA-04 (3C), BA-05 (4C)		
				BA-06 (2C), BA-07 (3C), BA-08 (4C)		
				BA-09 (2C), BA-10 (3C), BA-11 (4C)		
Viscosity at 140°F, 275°F	AE05	P25	11	BA-01 (3C), BA-02 (4C)	X	-
				BA-03 (2C), BA-04 (3C), BA-05 (4C)		
				BA-06 (2C), BA-07 (3C), BA-08 (4C)		
				BA-09 (2C), BA-10 (3C), BA-11 (4C)		
<b>Asphalt Cement (From Plant)</b>						
Penetration at 77°F, 115°F	AE02	P22	3	BC-02, BC-03, BC-04	X	-
Specific Gravity (60°F)	AE03	P23	3	BC-02, BC-03, BC-04	X	-
Viscosity at 77°F	AE04	P24	3	BC-02, BC-03, BC-04	X	-
Viscosity at 140°F, 275°F	AE05	P25	3	BC-02, BC-03, BC-04	X	-

NOTE 1: Each asphalt concrete core contains different layers. The 4 inch thick asphalt concrete cores contain two layers (1 layer leveling L1 (2C), 1 layer surface S (4C)) while the 7 inch thick (SHRP Sections) and 6.5 inch thick (Control Section) contain three layers (1 layer leveling L1 (2C), 1 intermediate layer leveling L2 (3C), surface S (4C)). The suffixes to the core number L1 and L2 refer to the first and second leveling courses (2C and 3C). Where only one leveling course was used (3C) the designation is L1. S always refers to the surface course (4C).

TABLE 27 (CONTINUED). LOCATIONS FOR ASPHALT CONCRETE CORES

Core Number	Sample Area	Core Location from Beginning of Monitoring Section	Test Section	Offset from Outer Edge of Pavement (ft)	Core from ATB ?
C50	20	5+10	260119	6	—
C51	21	0-25	260117	3	Yes
C52	21	0-25	260117	6	Yes
C53	22	5+25	260117	3	Yes
C54	22	5+25	260117	6	Yes
C55	23	0-25	260115	3	Yes
C56	23	0-25	260115	4½	Yes
C57	23	0-25	260115	6	Yes
C58	23	0-25	260115	7½	Yes
C59	24	5+25	260115	3	Yes
C60	24	5+25	260115	6	Yes
C61	C1	0-25	260159	3	—
C62	C1	0-25	260159	4½	—
C63	C1	0-25	260159	6	—
C64	C1	0-25	260159	7½	—
C65	C2	5+25	260159	3	—
C66	C2	5+25	260159	6	—

TABLE 29. TEST LOCATIONS FOR NUCLEAR DENSITY TESTS ON ASPHALT CONCRETE

Monitoring Section	Test Location from Beginning of Monitoring Section	Offset from Outer Edge of Pavement (ft)	Test Designation		
			First Levelling Course	Second Levelling Course	Surface Course
260121	1+00	6	D22L1	--	D22S
260121	2+50	6	D23L1	--	D23S
260121	4+00	6	D24L1	--	D24S
260120	1+00	6	D25L1	--	D25S
260120	2+50	6	D26L1	--	D26S
260120	4+00	6	D27L1	--	D27S
260118	1+00	6	D28L1	--	D28S
260118	2+50	6	D29L1	--	D29S
260118	4+00	6	D30L1	--	D30S
260116	1+00	6	D31L1	--	D31S
260116	2+50	6	D32L1	--	D32S
260116	4+00	6	D33L1	--	D33S
260124	1+00	6	D34L1	D34L2	D34S
260124	2+50	6	D35L1	D35L2	D35S
260124	4+00	6	D36L1	D36L2	D36S
260123	1+00	6	D37L1	D37L2	D37S
260123	2+50	6	D38L1	D38L2	D38S
260123	4+00	6	D39L1	D39L2	D39S
260122	1+00	6	D40L1	--	D40S
260122	2+50	6	D41L1	--	D41S
260122	4+00	6	D42L1	--	D42S
260113	1+00	6	D43L1	--	D43S
260113	2+50	6	D44L1	--	D44S
260113	4+00	6	D45L1	--	D45S
260114	1+00	6	D46L1	D46L2	D46S
260114	2+50	6	D47L1	D47L2	D47S
260114	4+00	6	D48L1	D48L2	D48S
260119	1+00	6	D49L1	D49L2	D49S
260119	2+50	6	D50L1	D50L2	D50S
260119	4+00	6	D51L1	D51L2	D51S
260117	1+00	6	D52L1	D52L2	D52S
260117	2+50	6	D53L1	D53L2	D53S
260117	4+00	6	D54L1	D54L2	D54S
260115	1+00	6	D55L1	D55L2	D55S
260115	2+50	6	D56L1	D56L2	D56S
260115	4+00	6	D57L1	D57L2	D57S
260159	1+00	6	D58L1	D58L2	D58S
260159	2+50	6	D59L1	D59L2	D59S
260159	4+00	6	D60L1	D60L2	D60S

TABLE 30 – TRACKING TABLE OF ASPHALT CONCRETE TESTING  
IN THE STATE LABORATORY

SAMPLE LOCATION NUMBER	SAMPLE NUMBER	LAB TEST NUMBER	STEPS INVOLVED IN LAB HANDLING AND TESTING SEQUENCE						
			REQUIRED TESTS PER LAYER				EXTRA SAMPLE	SAMPLE STORAGE	SAMPLE DISPOSED?
			FIRST	SECOND	THIRD	FOURTH			
C1	CA01	1	AC01/P01	AC02/P02			YES	(A)	NO
C2	CA02	1	AC01/P01	AC02/P02			YES	(A)	NO
C4	CA04	2	AC01/P01	AC02/P02			YES	(A)	NO
C9	CA09	2	AC01/P01	AC02/P02			YES	(A)	NO
C10	CA10	2	AC01/P01	AC02/P02			YES	(A)	NO
C15	CA15	2	AC01/P01	AC02/P02			YES	(A)	NO
C16	CA16	2	AC01/P01	AC02/P02			YES	(A)	NO
C17	CA17	1	AC01/P01	AC02/P02			YES	(A)	NO
C18	CA18	1	AC01/P01	AC02/P02			YES	(A)	NO
C19	CA19	2	AC01/P01	AC02/P02			YES	(A)	NO
C20	CA20	2	AC01/P01	AC02/P02			YES	(A)	NO
C21	CA21	1	AC01/P01	AC02/P02			YES	(A)	NO
C22	CA22	1	AC01/P01	AC02/P02			YES	(A)	NO
C23	CA23	2	AC01/P01	AC02/P02			YES	(A)	NO
C24	CA24	2	AC01/P01	AC02/P02			YES	(A)	NO
C25	CA25	1	AC01/P01	AC02/P02			YES	(A)	NO
C26	CA26	1	AC01/P01	AC02/P02			YES	(A)	NO
C27	CA27	2	AC01/P01	AC02/P02			YES	(A)	NO
C28	CA28	2	AC01/P01	AC02/P02			YES	(A)	NO
C33	CA33	2	AC01/P01	AC02/P02			YES	(A)	NO
C34	CA34	2	AC01/P01	AC02/P02			YES	(A)	NO
C35	CA35	1	AC01/P01	AC02/P02			YES	(A)	NO
C36	CA36	1	AC01/P01	AC02/P02			YES	(A)	NO
C37	CA37	2	AC01/P01	AC02/P02			YES	(A)	NO
C38	CA38	2	AC01/P01	AC02/P02			YES	(A)	NO
C43	CA43	2	AC01/P01	AC02/P02			YES	(A)	NO
C44	CA44	2	AC01/P01	AC02/P02			YES	(A)	NO
C45	CA45	1	AC01/P01	AC02/P02			YES	(A)	NO
C46	CA46	1	AC01/P01	AC02/P02			YES	(A)	NO
C47	CA47	1	AC01/P01	AC02/P02			YES	(A)	NO
C48	CA48	1	AC01/P01	AC02/P02			YES	(A)	NO
C49	CA49	2	AC01/P01	AC02/P02			YES	(A)	NO
C50	CA50	2	AC01/P01	AC02/P02			YES	(A)	NO
C51	CA51	1	AC01/P01	AC02/P02			YES	(A)	NO
C52	CA52	1	AC01/P01	AC02/P02			YES	(A)	NO

TABLE 31 – TRACKING TABLE OF ASPHALT TREATED BASE TESTING  
IN THE STATE LABORATORY

SAMPLE LOCATION NUMBER	SAMPLE NUMBER	LAB TEST NUMBER	STEPS INVOLVED IN LAB HANDLING AND TESTING SEQUENCE										
			REQUIRED TESTS PER LAYER				EXTRA SAMPLE	SAMPLE STORAGE	SAMPLE DISPOSED?				
			FIRST	SECOND	THIRD	FOURTH							
C15	CT15	2	AC01/P01	AC02/P02				YES	(A)	NO			
C16	CT16	2	AC01/P01	AC02/P02				YES	(A)	NO			
C17	CT17	1	AC01/P01	AC02/P02				YES	(A)	NO			
C18	CT18	1	AC01/P01	AC02/P02				YES	(A)	NO			
C19	CT19	2	AC01/P01	AC02/P02				YES	(A)	NO			
C20	CT20	2	AC01/P01	AC02/P02				YES	(A)	NO			
C21	CT21	1	AC01/P01	AC02/P02				YES	(A)	NO			
C22	CT22	1	AC01/P01	AC02/P02				YES	(A)	NO			
C23	CT23	2	AC01/P01	AC02/P02				YES	(A)	NO			
C24	CT24	2	AC01/P01	AC02/P02				YES	(A)	NO			
C25	CT25	1	AC01/P01	AC02/P02				YES	(A)	NO			
C26	CT26	1	AC01/P01	AC02/P02				YES	(A)	NO			
C27	CT27	2	AC01/P01	AC02/P02				YES	(A)	NO			
C28	CT28	2	AC01/P01	AC02/P02				YES	(A)	NO			
C33	CT33	2	AC01/P01	AC02/P02				YES	(A)	NO			
C34	CT34	2	AC01/P01	AC02/P02				YES	(A)	NO			
C51	CT51	1	AC01/P01	AC02/P02				YES	(A)	NO			
C52	CT52	1	AC01/P01	AC02/P02				YES	(A)	NO			
C53	CT53	2	AC01/P01	AC02/P02				YES	(A)	NO			
C54	CT54	2	AC01/P01	AC02/P02				YES	(A)	NO			
C59	CT59	2	AC01/P01	AC02/P02				YES	(A)	NO			
C60	CT60	2	AC01/P01	AC02/P02				YES	(A)	NO			
BT-01	BT20	1	FOLLOW FLOW CHART FIG. 10 ON PAGES 69,70 OF MST GUIDE REFER TO SECTION 4.7.4 OF SPS-1 MST GUIDELINES						YES	(A)	NO		
BT-02	BT21	1									YES	(A)	NO
BT-03	BT22	1									YES	(A)	NO
BT-04	BT23	2									YES	(A)	NO
BC-01	BC-01	3	AE02/P22	AE03/P23	AE04/P24	AE05/P25		YES	(A)	NO			

NOTE A: ALL SAMPLES OR PORTIONS OF SAMPLES THAT ARE NOT TESTED SHALL BE STORED IN ENVIRONMENTALLY PROTECTED ROOM AT A TEMPERATURE OF 40°F – 70° F UNTIL FURTHER NOTICE. CARE SHALL BE TAKEN TO PROVIDE PROPER SAMPLE IDENTIFICATION.

TABLE 31 – TRACKING TABLE OF ASPHALT TREATED BASE TESTING  
IN THE STATE LABORATORY

SAMPLE LOCATION NUMBER	SAMPLE NUMBER	LAB TEST NUMBER	STEPS INVOLVED IN LAB HANDLING AND TESTING SEQUENCE						
			REQUIRED TESTS PER LAYER				EXTRA SAMPLE	SAMPLE STORAGE	SAMPLE DISPOSED?
			FIRST	SECOND	THIRD	FOURTH			
C15	CT15	2	AC01/P01	AC02/P02			YES	(A)	NO
C16	CT16	2	AC01/P01	AC02/P02			YES	(A)	NO
C17	CT17	1	AC01/P01	AC02/P02			YES	(A)	NO
C18	CT18	1	AC01/P01	AC02/P02			YES	(A)	NO
C19	CT19	2	AC01/P01	AC02/P02			YES	(A)	NO
C20	CT20	2	AC01/P01	AC02/P02			YES	(A)	NO
C21	CT21	1	AC01/P01	AC02/P02			YES	(A)	NO
C22	CT22	1	AC01/P01	AC02/P02			YES	(A)	NO
C23	CT23	2	AC01/P01	AC02/P02			YES	(A)	NO
C24	CT24	2	AC01/P01	AC02/P02			YES	(A)	NO
C25	CT25	1	AC01/P01	AC02/P02			YES	(A)	NO
C26	CT26	1	AC01/P01	AC02/P02			YES	(A)	NO
C27	CT27	2	AC01/P01	AC02/P02			YES	(A)	NO
C28	CT28	2	AC01/P01	AC02/P02			YES	(A)	NO
C33	CT33	2	AC01/P01	AC02/P02			YES	(A)	NO
C34	CT34	2	AC01/P01	AC02/P02			YES	(A)	NO
C51	CT51	1	AC01/P01	AC02/P02			YES	(A)	NO
C52	CT52	1	AC01/P01	AC02/P02			YES	(A)	NO
C53	CT53	2	AC01/P01	AC02/P02			YES	(A)	NO
C54	CT54	2	AC01/P01	AC02/P02			YES	(A)	NO
C59	CT59	2	AC01/P01	AC02/P02			YES	(A)	NO
C60	CT60	2	AC01/P01	AC02/P02			YES	(A)	NO
BT-01	BT20	1	FOLLOW FLOW CHART FIG. 10 ON PAGES 69,70 OF MST GUIDE REFER TO SECTION 4.7.4 OF SPS--1 MST GUIDELINES				YES	(A)	NO
BT-02	BT21	1					YES	(A)	NO
BT-03	BT22	1					YES	(A)	NO
BT-04	BT23	2					YES	(A)	NO
BC-01	BC-01	3	AE02/P22	AE03/P23	AE04/P24	AE05/P25	YES	(A)	NO

NOTE A: ALL SAMPLES OR PORTIONS OF SAMPLES THAT ARE NOT TESTED SHALL BE STORED IN ENVIRONMENTALLY CONTROLLED ROOM UNTIL FURTHER NOTICE. CARE SHALL BE TAKEN TO PROVIDE PROPER SAMPLE IDENTIFICATION.

TABLE 32 – TRACKING TABLE OF PERMEABLE ASPHALT TREATED BASE  
AND ASPHALT STABILIZED PERMEABLE BASE TESTING IN THE STATE LABORATORY

SAMPLE LOCATION NUMBER	SAMPLE NUMBER	LAB TEST NUMBER	STEPS INVOLVED IN LAB HANDLING AND TESTING SEQUENCE							
			REQUIRED TESTS PER LAYER				EXTRA SAMPLE	SAMPLE STORAGE	SAMPLE DISPOSED?	
			FIRST	SECOND	THIRD	FOURTH				
BP01	BT-01	2	AC04/P04	AG04/P14				NO	(A)	NO
BP01	BT-02	1	AC04/P04	AG04/P14				NO	(A)	NO
BP03	BT-03	1	AC04/P04	AG04/P14				NO	(A)	NO
BP04	BT-04	1	AC04/P04	AG04/P14				NO	(A)	NO
BP05	BT-05	1	AC04/P04	AG04/P14				NO	(A)	NO

NOTE A: ALL SAMPLES OR PORTIONS OF SAMPLES THAT ARE NOT TESTED SHALL BE STORED IN ENVIRONMENTALLY CONTROLLED ROOM UNTIL FURTHER NOTICE. CARE SHALL BE TAKEN TO PROVIDE PROPER SAMPLE IDENTIFICATION.

TABLE 33 – TRACKING TABLE OF UNBOUND GRANULAR BASE TESTING  
IN THE STATE LABORATORY

SAMPLE LOCATION NUMBER	SAMPLE NUMBER	LAB TEST NUMBER	STEPS INVOLVED IN LAB HANDLING AND TESTING SEQUENCE							
			REQUIRED TESTS PER LAYER				EXTRA SAMPLE	SAMPLE STORAGE	SAMPLE DISPOSED?	
			FIRST	SECOND	THIRD	FOURTH				
B8	BG05	2	UG09/P48					NO	(B)	YES
B9	BG01	1	UG09/P48					NO	(B)	YES
B10	BG02	1	UG09/P48					NO	(B)	YES
B11	BG03	1	UG09/P48					NO	(B)	YES
B12	BG04	2	UG09/P48					NO	(B)	YES
B13	BG06	1	UG09/P48					NO	(B)	YES

NOTE B: ALL SAMPLES SHALL BE STORED IN ENVIRONMENTALLY CONTROLLED ROOM AT 40° – 100°F.

TABLE 34 – TRACKING TABLE OF EMBANKMENT OR SUBGRADE (CONTROL SECTION) TESTING IN THE STATE LABORATORY

SAMPLE LOCATION NUMBER	SAMPLE NUMBER	LAB TEST NUMBER	STEPS INVOLVED IN LAB HANDLING AND TESTING SEQUENCE						
			REQUIRED TESTS PER LAYER				EXTRA SAMPLE	SAMPLE STORAGE	SAMPLE DISPOSED?
			FIRST	SECOND	THIRD	FOURTH			
B1	BS01	2	NO TESTING – SAMPLES STORED (SEE NOTE 1)				YES	(B)	NO
B2	BS02	2	NO TESTING – SAMPLES STORED (SEE NOTE 1)				YES	(B)	NO
B3	BS03	1	NO TESTING – SAMPLES STORED (SEE NOTE 1)				YES	(B)	NO
B4	BS04	2	NO TESTING – SAMPLES STORED (SEE NOTE 1)				YES	(B)	NO
B5	BS05	1	NO TESTING – SAMPLES STORED (SEE NOTE 1)				YES	(B)	NO
B6	BS06	2	NO TESTING – SAMPLES STORED (SEE NOTE 1)				YES	(B)	NO
B7	BS07	2	NO TESTING – SAMPLES STORED (SEE NOTE 1)				YES	(B)	NO
A2	A2#1 (TS03)	3	SS04/P52	SS08/P56	SS10/P54		NO	(C)	YES
A6	A6#1 (TS08)	3	SS04/P52	SS08/P56	SS10/P54	SS11/P57 NOTE 2	NO	(C)	YES
A11	A11#2 (TS11)	3	SS04/P52	SS08/P56	SS10/P54	SS11/P57 NOTE 2	NO	(C)	YES
A13	A13#1 (TS14)	3	SS04/P52	SS08/P56	SS10/P54	SS11/P57 NOTE 2	NO	(C)	YES
A17	A17#1 (TS22)	3	SS04/P52	SS08/P56	SS10/P54	SS11/P57 NOTE 2	NO	(C)	YES
A19	A19#1 (TS29)	3	SS04/P52	SS08/P56	SS10/P54	SS11/P57 NOTE 2	NO	(C)	YES
A19	A19#2 (TS30)	3	SS04/P52	SS08/P56	SS10/P54		NO	(C)	YES
A23	A23#2 (TS27)	3	SS04/P52	SS08/P56	SS10/P54		NO	(C)	YES
A2	A2#2 (TS04)	3					YES NOTE 2	(C)	NO
A6	A6#2 (TS09)	3					YES NOTE 2	(C)	NO
A13	A13#2 (TS15)	3					YES NOTE 2	(C)	NO
A17	A17#2 (TS23)	3					YES NOTE 2	(C)	NO

NOTE 1: SAMPLES ARE SAVED FOR REMOLDED PERMEABILITY SAMPLES IF THINWALL TUBES ARE NOT TEST QUALITY

NOTE 2: USE ADDITIONAL SAMPLES FOR REQUIRED TESTS IF NECESSARY.

NOTE B: STORE SAMPLES IN AN ENVIRONMENTALLY PROTECTED STOREROOM AT TEMPERATURES BETWEEN 40° – 100°F.

NOTE C: THIN WALL SAMPLES SHALL BE STORED IN A FULLY SUPPORTED CONDITION AND AT TEMPERATURES BETWEEN 40°F AND 70°F IN AN ENVIRONMENTALLY PROTECTED STOREROOM.

TABLE 35 – TRACKING TABLE OF ASPHALT CONCRETE TESTING  
IN THE FHWA LABORATORY

SAMPLE LOCATION NUMBER	SAMPLE NUMBER	LAB TEST NUMBER	STEPS INVOLVED IN LAB HANDLING AND TESTING SEQUENCE							
			REQUIRED TESTS PER LAYER				EXTRA SAMPLE	SAMPLE STORAGE	SAMPLE DISPOSED?	
			FIRST	SECOND	THIRD	FOURTH				
C3	CA03	2	AC01/P01	AC02/P02	AC06/P06			NO	(A)	YES
C5	CA05	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C6	CA06	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C7	CA07	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C8	CA08	1	AC01/P01	AC02/P02	ACO7/P07 ITS			NO	(A)	YES
C11	CA11	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C12	CA12	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C13	CA13	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C14	CA14	1	AC01/P01	AC02/P02	ACO7/P07 ITS			NO	(A)	YES
C23	CA23	2	AC01/P01	AC02/P02	AC06/P06			NO	(A)	YES
C29	CA29	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C30	CA30	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C31	CA31	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C32	CA32	1	AC01/P01	AC02/P02	ACO7/P07 ITS			NO	(A)	YES
C39	CA39	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C40	CA40	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C41	CA41	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C42	CA42	1	AC01/P01	AC02/P02	ACO7/P07 ITS			NO	(A)	YES
C50	CA50	2	AC01/P01	AC02/P02	AC06/P06			NO	(A)	YES
C55	CA55	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C56	CA56	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C57	CA57	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C58	CA58	1	AC01/P01	AC02/P02	ACO7/P07 ITS			NO	(A)	YES
C61	CA61	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C62	CA62	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C63	CA63	1	AC01/P01	AC02/P02	ACO7/P07	ACO7/P07 ITS		NO	(A)	YES
C64	CA64	1	AC01/P01	AC02/P02	ACO7/P07 ITS			NO	(A)	YES

NOTE A: ALL SAMPLES OR PORTIONS OF SAMPLES THAT ARE NOT TESTED SHALL BE STORED IN ENVIRONMENTALLY PROTECTED ROOM AT A TEMPERATURE OF 40°F – 70°F.

TABLE 36 – TRACKING TABLE OF ASPHALT TREATED BASE TESTING  
IN THE FHWA LABORATORY

SAMPLE LOCATION NUMBER	SAMPLE NUMBER	LAB TEST NUMBER	STEPS INVOLVED IN LAB HANDLING AND TESTING SEQUENCE						
			REQUIRED TESTS PER LAYER				EXTRA SAMPLE	SAMPLE STORAGE	SAMPLE DISPOSED?
			FIRST	SECOND	THIRD	FOURTH			
C11	CT11	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07 ITS	NO	(A)	YES
C12	CT12	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07 ITS	NO	(A)	YES
C13	CT13	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07 ITS	NO	(A)	YES
C14	CT14	1	AC01/P01	AC02/P02	AC07/P07 ITS		NO	(A)	YES
C29	CT29	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07 ITS	NO	(A)	YES
C30	CT30	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07 ITS	NO	(A)	YES
C31	CT31	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07 ITS	NO	(A)	YES
C32	CT52	1	AC01/P01	AC02/P02	AC07/P07 ITS		NO	(A)	YES
C55	CT55	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07 ITS	NO	(A)	YES
C56	CT56	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07 ITS	NO	(A)	YES
C57	CT57	1	AC01/P01	AC02/P02	AC07/P07	AC07/P07 ITS	NO	(A)	YES
C58	CT58	1	AC01/P01	AC02/P02	AC07/P07 ITS		NO	(A)	YES

NOTE A: ALL SAMPLES SHALL BE STORED IN ENVIRONMENTALLY PROTECTED ROOM AT A TEMPERATURE OF 40° – 70°F

TABLE 37 – TRACKING TABLE OF UNBOUND GRANULAR BASE TESTING  
IN THE FHWA LABORATORY

SAMPLE LOCATION NUMBER	SAMPLE NUMBER	LAB TEST NUMBER	STEPS INVOLVED IN LAB HANDLING AND TESTING SEQUENCE								
			REQUIRED TESTS PER LAYER						EXTRA SAMPLE	SAMPLE STORAGE	SAMPLE DISPOSED?
			FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH			
B8	BG05	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	NO	(B)	YES
	MG05	2	UG10/P49						NO	(B)	YES
B9	BG01	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	NO	(B)	YES
	MG01	1	UG10/P49						NO	(B)	YES
B10	BG02	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	NO	(B)	YES
	MG02	1	UG10/P49						NO	(B)	YES
B11	BG03	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	NO	(B)	YES
	MG03	1	UG10/P49						NO	(B)	YES
B12	BG04	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	NO	(B)	YES
	MG04	2	UG10/P49						NO	(B)	YES
B13	BG06	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	NO	(B)	YES
	MG06	1	UG10/P49						NO	(B)	YES

NOTE B: ALL SAMPLES SHALL BE STORED IN ENVIRONMENTALLY CONTROLLED ROOM AT 40° – 100°F.

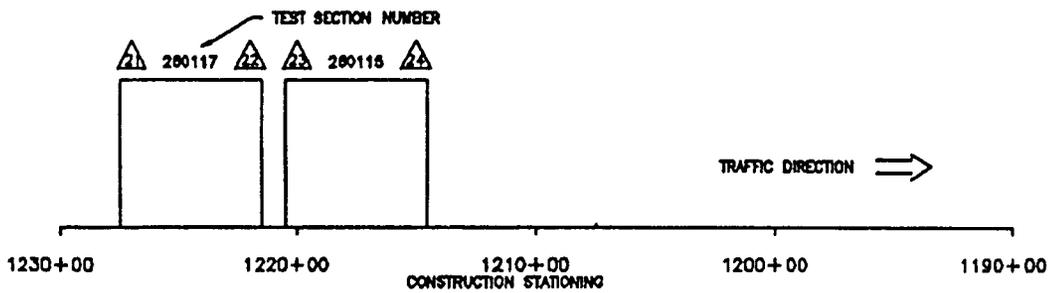
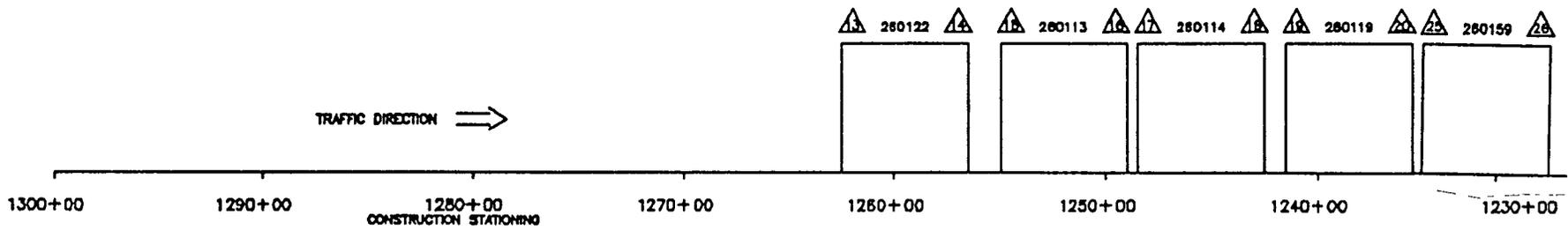
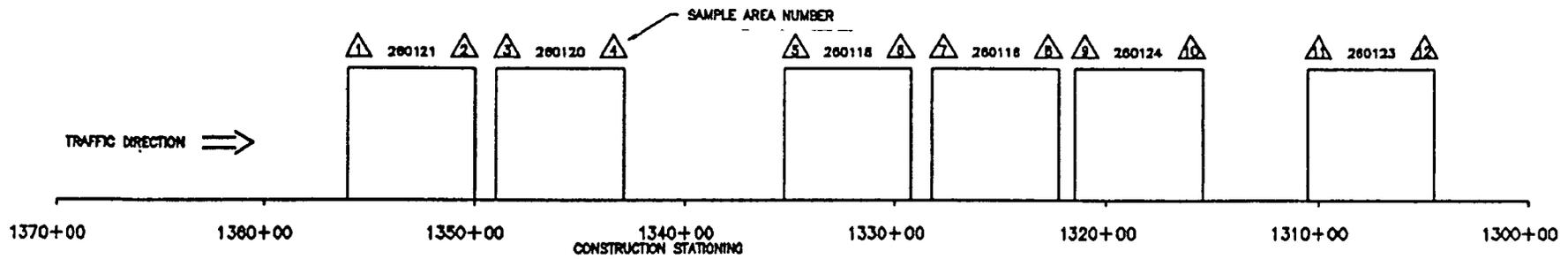
TABLE 38 – TRACKING TABLE OF EMBANKMENT OR SUBGRADE (CONTROL SECTION) TESTING IN THE FHWA LABORATORY

SAMPLE LOCATION NUMBER	SAMPLE NUMBER	LAB TEST NUMBER	STEPS INVOLVED IN LAB HANDLING AND TESTING SEQUENCE							
			REQUIRED TESTS PER LAYER					EXTRA SAMPLE	SAMPLE STORAGE	SAMPLE DISPOSED?
			FIRST	SECOND	THIRD	FOURTH	FIFTH			
B1	BS01	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	NO	(B)	YES
	MS01	2	SS09/P49					NO	(B)	YES
B2	BS02	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	NO	(B)	YES
	MS02	2	SS09/P49					NO	(B)	YES
B3	BS03	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	NO	(B)	YES
	MS03	1	SS09/P49					NO	(B)	YES
B4	BS04	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	NO	(B)	YES
	MS04	2	SS09/P49					NO	(B)	YES
B5	BS05	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	NO	(B)	YES
	MS05	1	SS09/P49					NO	(B)	YES
B6	BS06	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	NO	(B)	YES
	MS06	2	SS09/P49					NO	(B)	YES
B7	BS07	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	NO	(B)	YES
	MS07	2	SS09/P49					NO	(B)	YES
A1	A1#1 (TS01)	3	SS04/P52	SS07/P46				NO	(C)	YES
A4	A4#2 (TS06)	3	SS04/P52	SS07/P46				NO	(C)	YES
A12	A12#1 (TS12)	3	SS04/P52	SS07/P46				NO	(C)	YES
A14	A14#1 (TS16)	3	SS04/P52	SS07/P46				NO	(C)	YES
A15	A15#1 (TS18)	3	SS04/P52	SS07/P46				NO	(C)	YES
A16	A16#1 (TS20)	3	SS04/P52	SS07/P46				NO	(C)	YES
A18	A18#1 (TS24)	3	SS04/P52	SS07/P46				NO	(C)	YES
A20	A20#1 (TS31)	3	SS04/P52	SS07/P46				NO	(C)	YES
A22	A22#2 (TS26)	3	SS04/P52	SS07/P46				NO	(C)	YES
A1	A1#2 (TS02)	3						YES NOTE 1	(C)	NO
A3	A3#2 (TS05)	3						YES NOTE 1	(C)	NO
A5	A5#2 (TS07)	3						YES NOTE 1	(C)	NO
A10	A10#2 (TS10)	3						YES NOTE 1	(C)	NO
A12	A12#2 (TS13)	3						YES NOTE 1	(C)	NO
A14	A14#2 (TS17)	3						YES NOTE 1	(C)	NO
A15	A15#2 (TS19)	3						YES NOTE 1	(C)	NO
A16	A16#2 (TS21)	3						YES NOTE 1	(C)	NO
A18	A18#2 (TS25)	3						YES NOTE 1	(C)	NO
A20	A20#2 (TS 32)	3						YES NOTE 1	(C)	NO
A21	A21#2 (TS33)	3						YES NOTE 1	(C)	NO
A22	A22#2 (TS 26)	3						YES NOTE 1	(C)	NO

NOTE 1: USE ADDITIONAL SAMPLES FOR REQUIRED TESTS IF NECESSARY.

NOTE B: STORE SAMPLES IN AN ENVIRONMENTALLY PROTECTED STOREROOM AT TEMPERATURES BETWEEN 40° – 100°F.

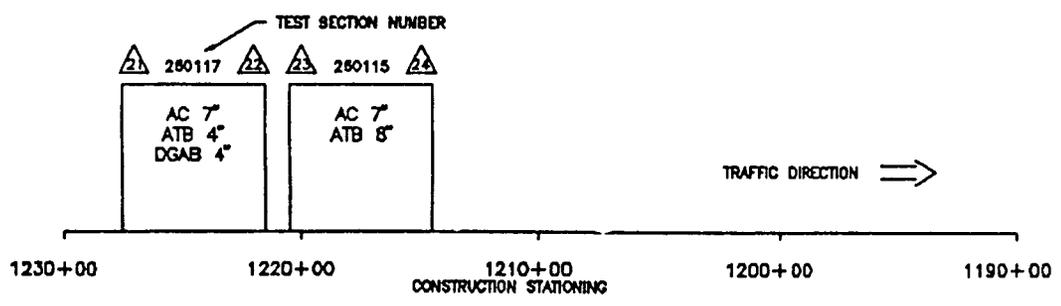
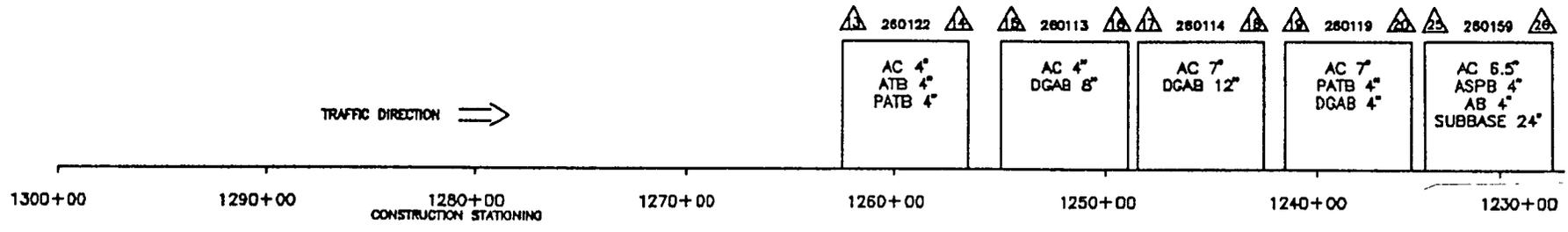
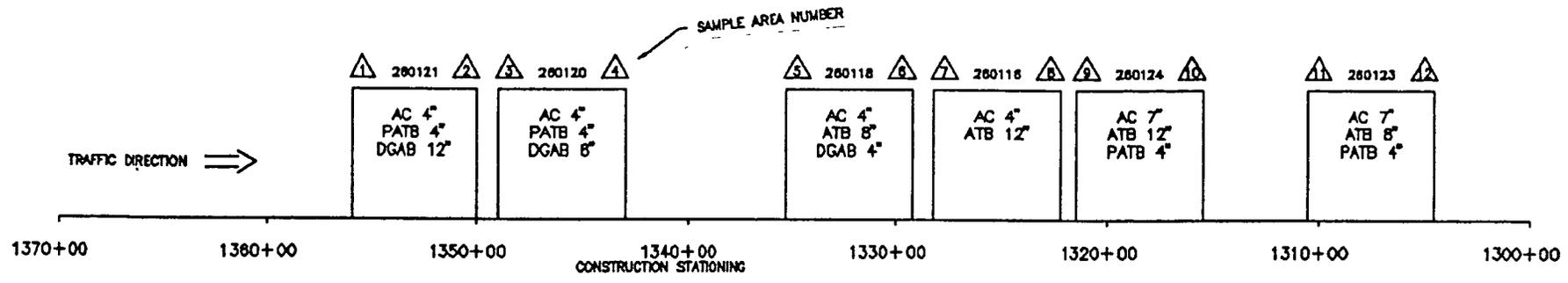
NOTE C: THIN WALL SAMPLES SHALL BE STORED IN A FULLY SUPPORTED CONDITION AND AT TEMPERATURES BETWEEN 40°F AND 70°F IN AN ENVIRONMENTALLY PROTECTED STOREROOM.



NOTES:

1. EACH TEST SECTION IS 600 ft. LONG

FIG. 1 - LAYOUT OF TEST SECTIONS



**NOTES:**

1. EACH TEST SECTION IS 600 ft. LONG
2. 260159 IS THE CONTROL SECTION
3. AC - ASPHALT CONCRETE  
 ATB - ASPHALT TREATED BASE  
 PATB - PERMEABLE ASPHALT TREATED BASE  
 DGAB - DENSE GRADED AGGREGATE BASE  
 AB - AGGREGATE BASE  
 ASPB - ASPHALT STABILIZED PERMEABLE BASE

FIG. 2 - DESIGN FEATURES OF TEST SECTIONS

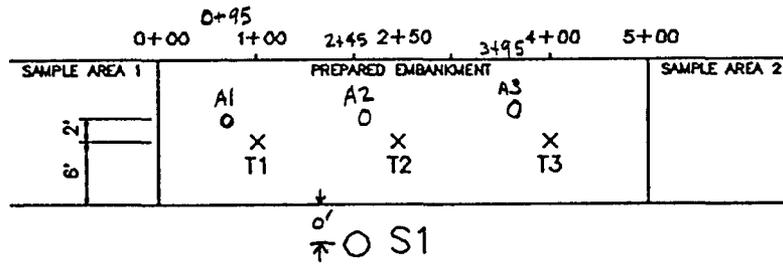
**FIGURE 3 - LEGEND FOR FIGURES 4 TO 16**

B1 - B7	Bulk Samples and Moisture Samples from Prepared Embankment or subgrade (control section)
B8	Bulk Sample and Moisture Sample from Compacted Subbase
B9 - B12	Bulk Samples and Moisture Samples from Compacted Aggregate Base
B13	Bulk Samples and Moisture Samples from Compacted Aggregate Base (Control Section)
BP-01 - BP-04	Bulk Sample from Uncompacted Permeable Asphalt Treated Material
BP-05	Bulk Sample from Uncompacted Asphalt Treated Permeable Base Material (Control Sections)
BT-1 - BT-4	Bulk Sample from Uncompacted Asphalt Treated Base
BC01	Bulk sample of Asphalt Cement used in production of ATB
BA-01 - BA-04	Bulk Samples of Uncompacted Asphalt Concrete and Asphalt Cement. Obtain Samples from the different asphalt concrete layers. The following sample designations are used: BA-01: BA-01 - First Leveling Course (3C); BA-02 - Surface Course (4C), BC-02 - Asphalt Cement BA-02: BA-03 - First Leveling Course (2C); BA-04 - Second Leveling Course (3C); BA-05 - Surface Course (4C), BC-03 - Asphalt Cement BA-03: BA-06 - First Leveling Course (2C); BA-07 - Second Leveling Course (3C); BA-08 - Surface Course (4C), BC-04 - Asphalt Cement BA-04: BA-09 - First Leveling Course (2C); BA-10 - Surface Course (4C)
BC02 - BC04	Bulk samples of Asphalt Cement used in production of Asphalt Concrete layers
A1-A6, A10-A21	Shelby Tube Samples from Embankment (Note A7 - A9 sampling not performed)
A22 - A24	Shelby Tube Samples from Subgrade (Control Section)
S1 - S7	Shoulder Probes (20 ft)
T1 - T42, T46	In-place Density and Moisture Tests on Prepared Embankment
T43 - T45	In-Place Density and Moisture Tests on Prepared Subgrade (Control Section)
T47-T49, T74	In-Place Density and Moisture Tests on Prepared Subbase (control section)
T50 - T70 T75 - T78	In-Place Density and Moisture Tests on Prepared Aggregate Base
T71 - T73, T79	In-Place Density and Moisture Tests on Prepared Aggregate Base (control section)

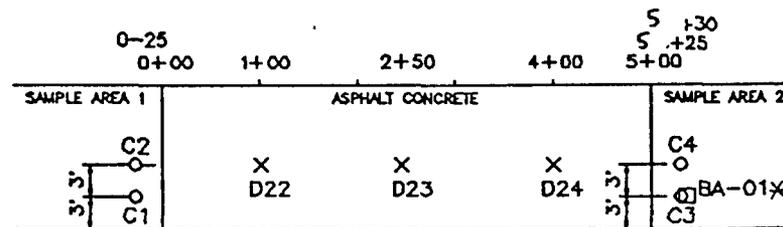
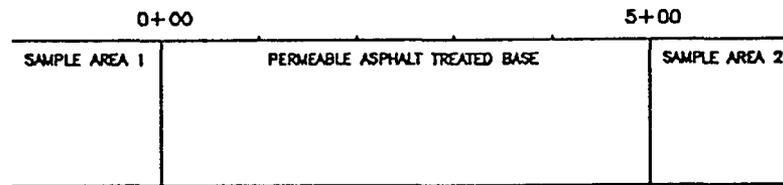
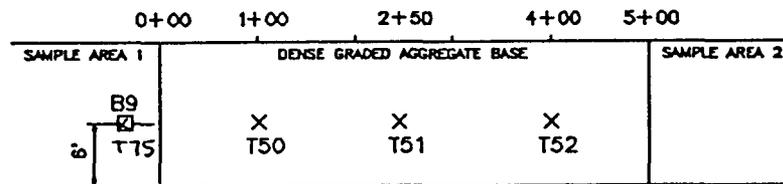
FIGURE 3 - LEGEND FOR FIGURES 4 TO 16  
Continued

D1 - D21	In-Place Density Tests on Prepared Asphalt Treated Base
D22 - D60	In-Place Density Tests on Prepared Asphalt Concrete. Perform Test on all Asphalt Layers. The Following Suffixes are used for the Test Locations in the Different Asphalt Concrete Layers: L1 - First Levelling Course, L2 - Second Levelling Course, S - Surface Course
C1 - C66	Asphalt Cores. Obtain Cores from the Asphalt Treated Base at the Specified Locations

TRAFFIC DIRECTION ⇒



0-30

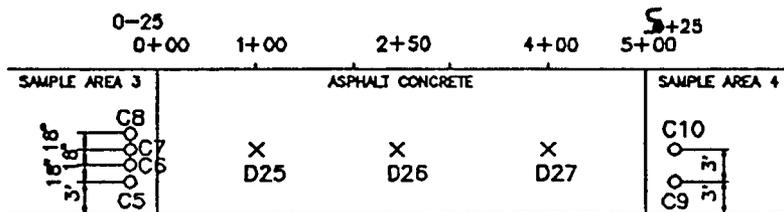
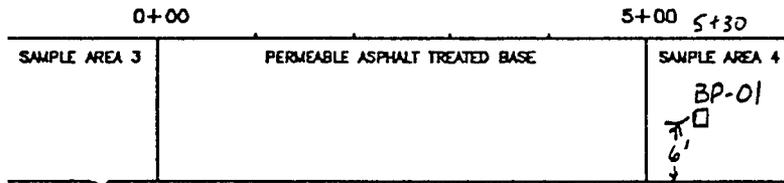
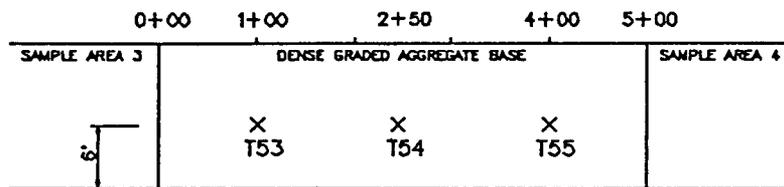
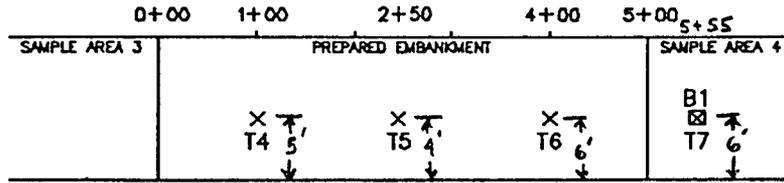


\* NOTE: BA-01 LOCATION  
 SAMPLE DESIGNATIONS ARE  
 BA-01: LEVELING LAYER 1  
 (3C)  
 BA-02: SURFACE (4C)  
 BC-02: ASPHALT CEMENT

PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

FIG. 4 - SAMPLING AND TESTING FOR TEST SECTION 260121

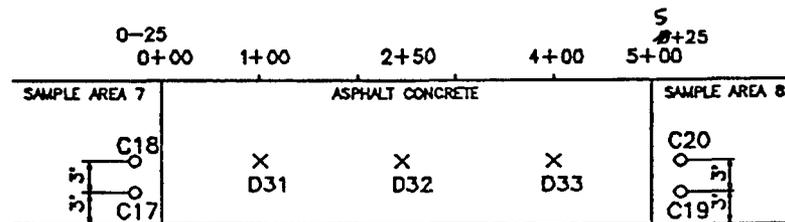
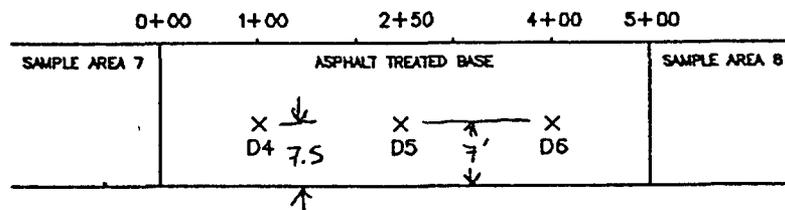
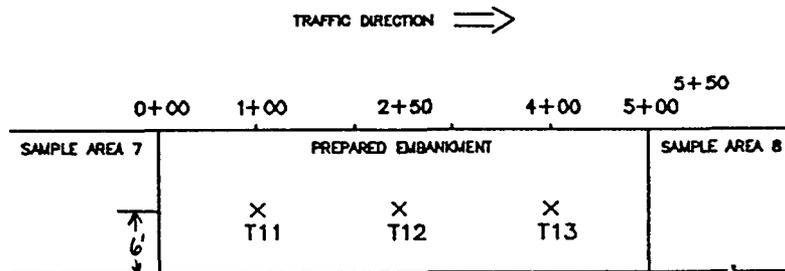
TRAFFIC DIRECTION  $\Rightarrow$



PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

FIG. 5 -- SAMPLING AND TESTING FOR TEST SECTION 260120

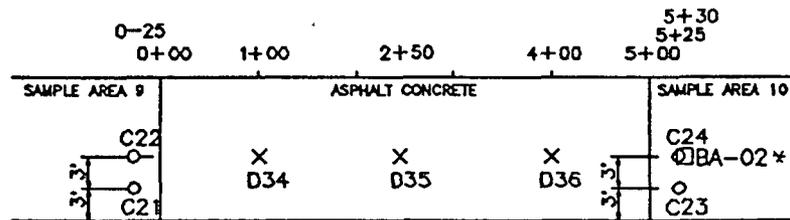
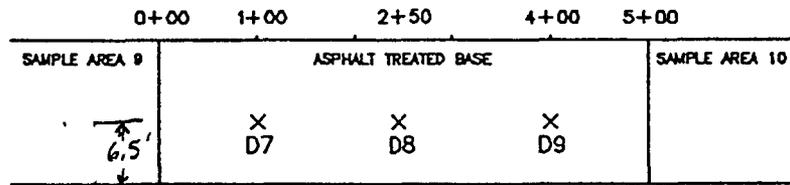
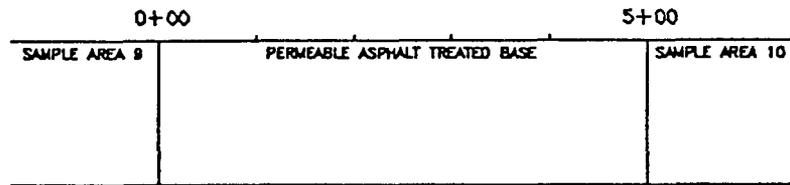
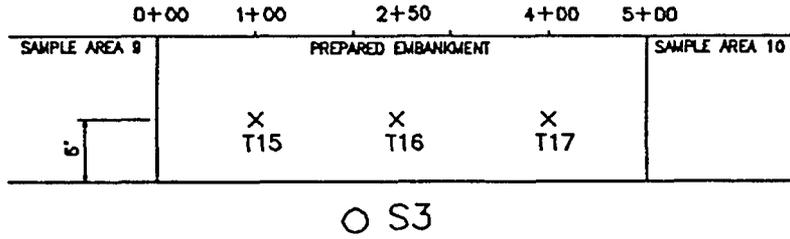




OBTAIN CORES FROM AC AND ATB  
PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

FIG. 7 — SAMPLING AND TESTING FOR TEST SECTION 260116

TRAFFIC DIRECTION ==>

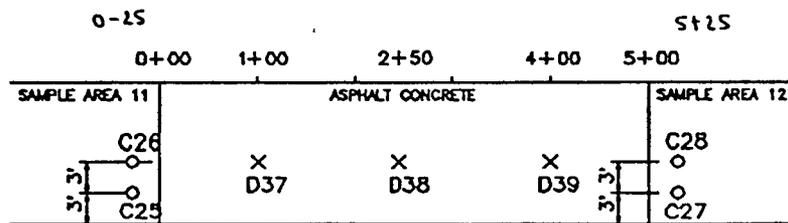
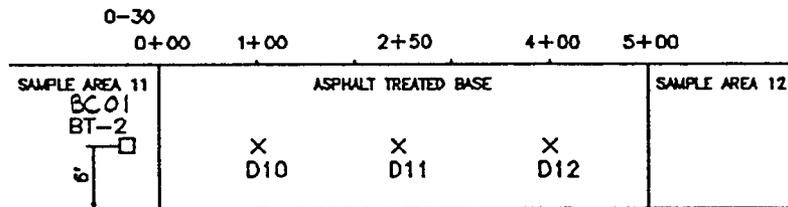
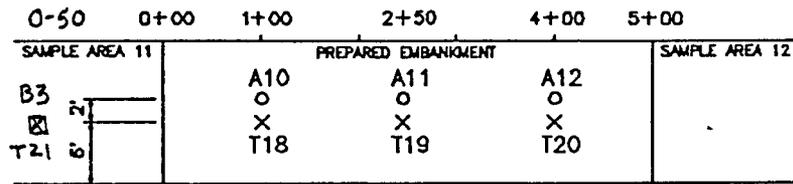


\* NOTE: BA-02 LOCATION  
 SAMPLE DESIGNATIONS ARE:  
 BA-03: LEVELING LAYER 1 (2C)  
 BA-04: LEVELING LAYER 2 (3C)  
 BA-05: SURFACE (4C)  
 BC-03: ASPHALT CEMENT

OBTAIN CORES FROM AC AND ATB  
 PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

FIG. 8 — SAMPLING AND TESTING FOR TEST SECTION 260124

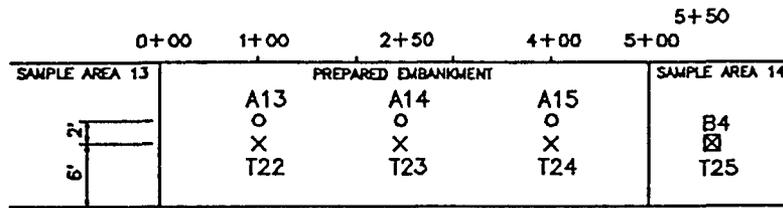
TRAFFIC DIRECTION  $\Rightarrow$



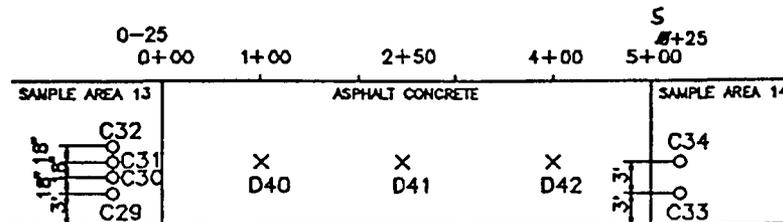
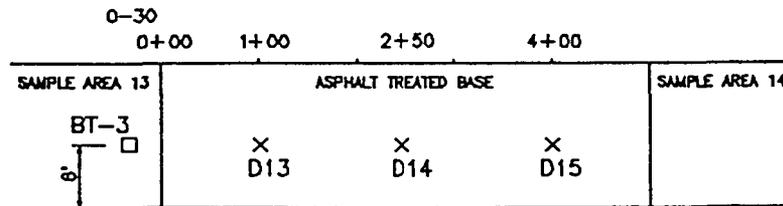
OBTAIN CORES FROM AC AND ATB  
PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

FIG. 9 — SAMPLING AND TESTING FOR TEST SECTION 260123

TRAFFIC DIRECTION ⇒

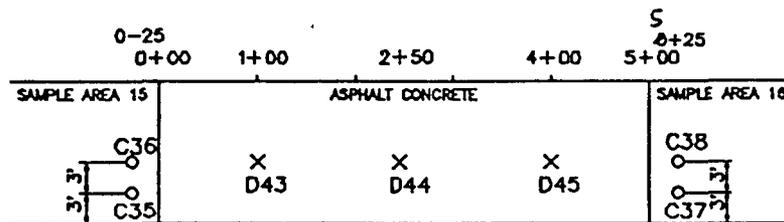
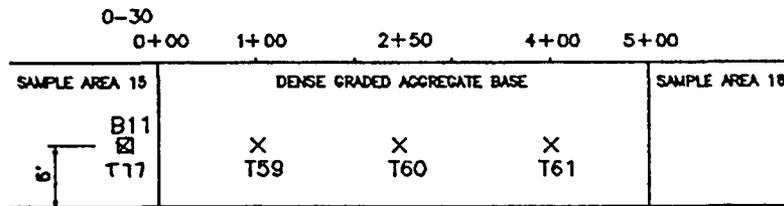
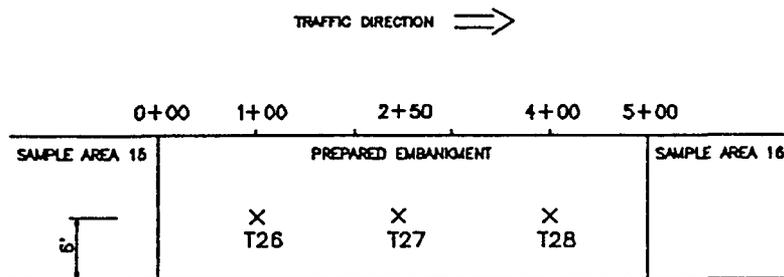


○ S4



PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

FIG. 10 → SAMPLING AND TESTING FOR TEST SECTION 260122



PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

FIG. 11 - SAMPLING AND TESTING FOR TEST SECTION 260113

TRAFFIC DIRECTION ⇒

0-56	0+00	1+00	2+50	4+00	5+00
SAMPLE AREA 17	PREPARED EMBANKMENT				SAMPLE AREA 18
B5 <input checked="" type="checkbox"/> T35 <input checked="" type="checkbox"/>	A16 ○ X T29	A17 ○ X T30	A18 ○ X T31		

○ S5

0+00	1+00	2+50	4+00	5+00	5+30
SAMPLE AREA 17	DENSE GRADED AGGREGATE BASE				SAMPLE AREA 18
○	X T62	X T63	X T64	B12 <input checked="" type="checkbox"/> T78	

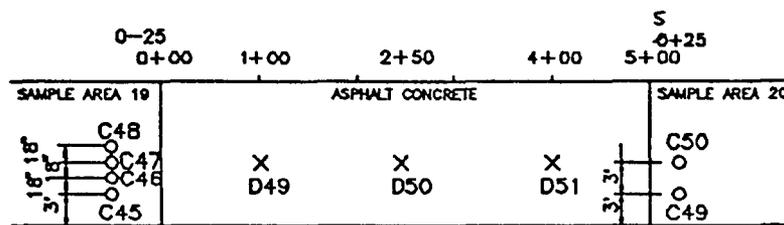
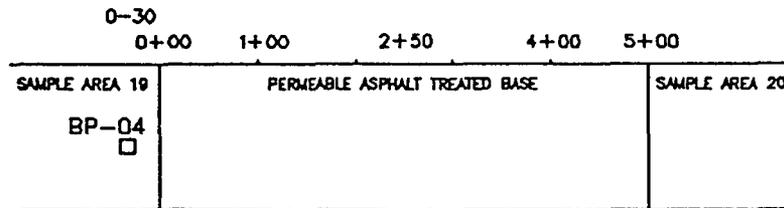
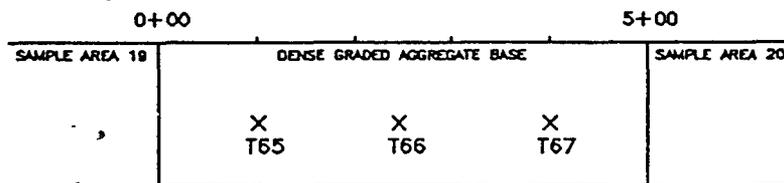
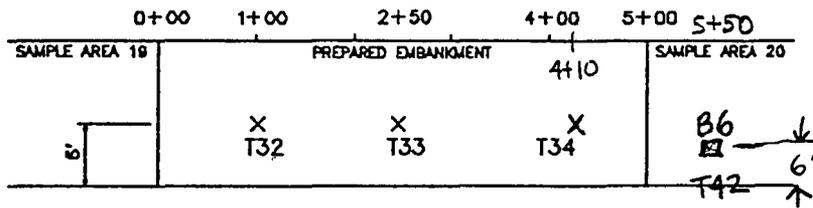
0-25 0+00	1+00	2+50	4+00	5+00	5+25 5+30
SAMPLE AREA 17	ASPHALT CONCRETE				SAMPLE AREA 18
C42 ○ C41 ○ C40 ○ C39	X D46	X D47	X D48	C44 <input checked="" type="checkbox"/> BA-03* ○ C43 <input checked="" type="checkbox"/>	

\* NOTE: BA-03 LOCATION  
SAMPLE DESIGNATIONS ARE:  
BA-06: LEVELING LAYER (2C)  
BA-07: LEVELING LAYER (3C)  
BA-08: SURFACE (4C)

PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

FIG. 12 - SAMPLING AND TESTING FOR TEST SECTION 260114

TRAFFIC DIRECTION ⇒



PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

FIG. 13 - SAMPLING AND TESTING FOR TEST SECTION 260119

TRAFFIC DIRECTION ⇒

	0+00	1+00	2+50	4+00	5+00
SAMPLE AREA 21	PREPARED EMBANKMENT				SAMPLE AREA 22
		A19	A20	A21	
		○	○	○	
		X	X	X	
		T36	T37	T38	

	0+00	1+00	2+50	4+00	5+00
SAMPLE AREA 21	DENSE GRADED AGGREGATE BASE				SAMPLE AREA 22
		X	X	X	
		T68	T69	T70	

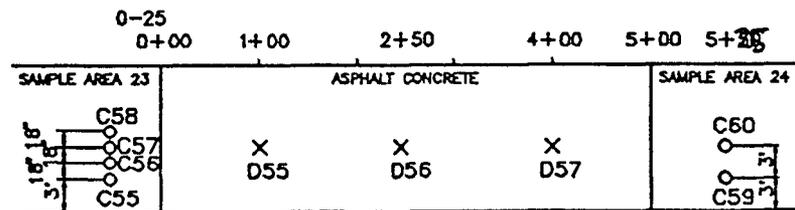
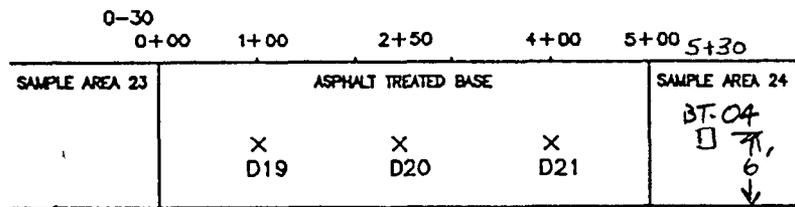
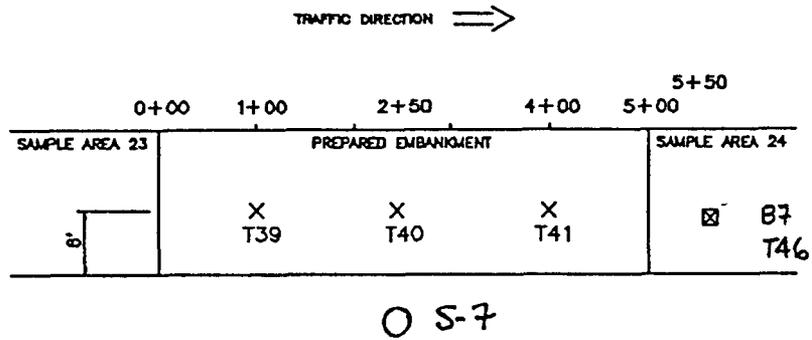
	0+00	1+00	2+50	4+00	5+00
SAMPLE AREA 21	ASPHALT TREATED BASE				SAMPLE AREA 22
		X	X	X	
		D16	D17	D18	

	0-25 0+00	1+00	2+50	4+00	5+00 5+25 5+30
SAMPLE AREA 21	ASPHALT CONCRETE				SAMPLE AREA 22
		X	X	X	
		D52	D53	D54	

\* NOTE: BA-04 LOCATION  
 SAMPLE DESIGNATIONS ARE:  
 BA-09: LEVELING LAYER 1 (2C)  
 BA-10: LEVELING LAYER 2 (3C)  
 BA-11: SURFACE (4C)  
 BC04: ASPHALT CEMENT

PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

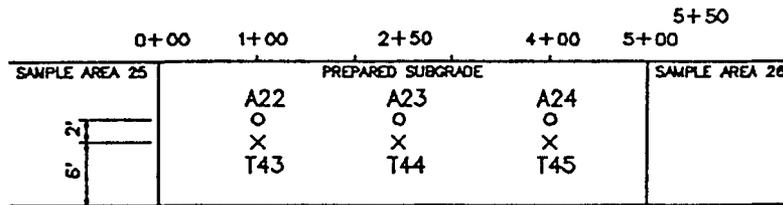
FIG. 14 - SAMPLING AND TESTING FOR TEST SECTION 260117



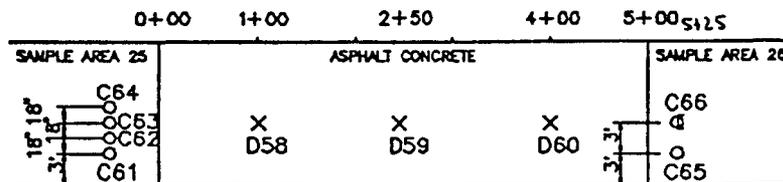
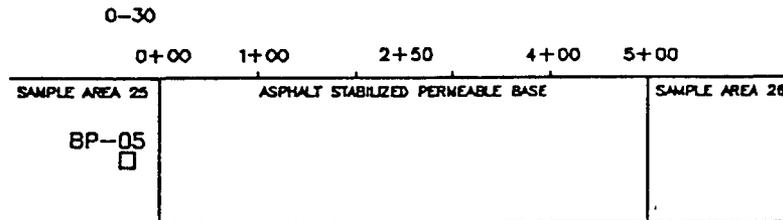
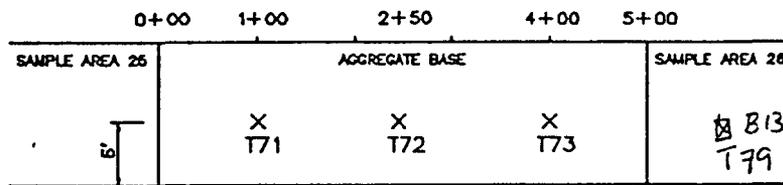
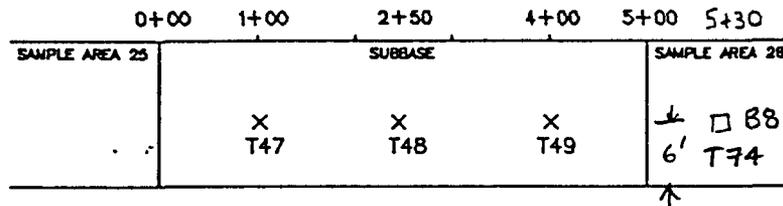
PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

FIG. 15 - SAMPLING AND TESTING FOR TEST SECTION 260115

TRAFFIC DIRECTION  $\Rightarrow$

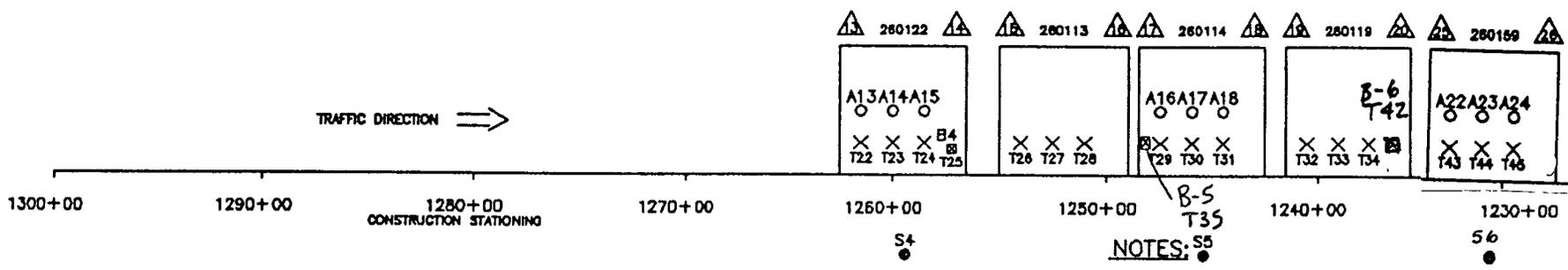
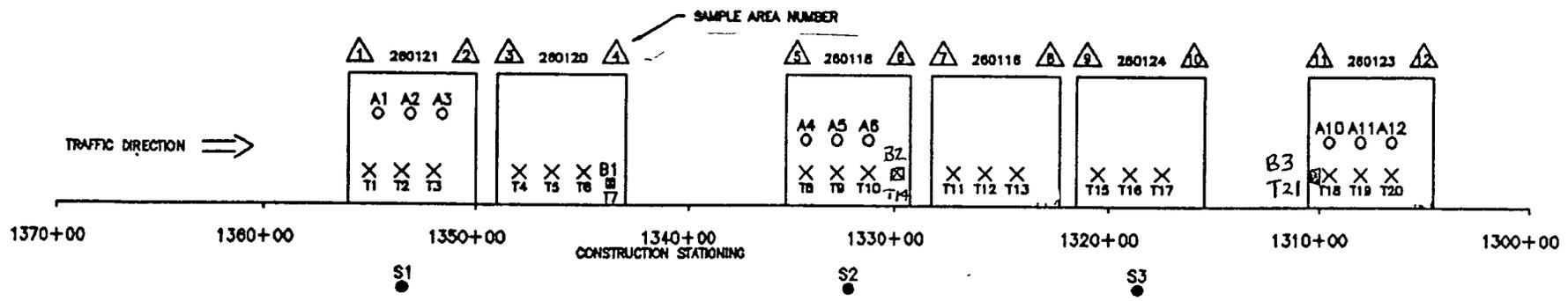


○ S6



PERFORM NUCLEAR DENSITY TESTS ON ALL ASPHALT LAYERS

FIG. 16 — SAMPLING AND TESTING FOR TEST SECTION 260159



**NOTES:**

1. EACH TEST SECTION IS 800 ft. LONG
2. T - NUCLEAR DENSITY/MOISTURE TESTS, B - BULK AND MOISTURE SAMPLES, A - THIN WALL TUBES, S - SHOULDER PROBES
3. CONDUCT ELEVATION MEASUREMENTS AND FWD TESTING ON ALL SECTIONS
4. CONDUCT NUCLEAR DENSITY TESTS ON BULK SAMPLING LOCATIONS BEFORE SAMPLING

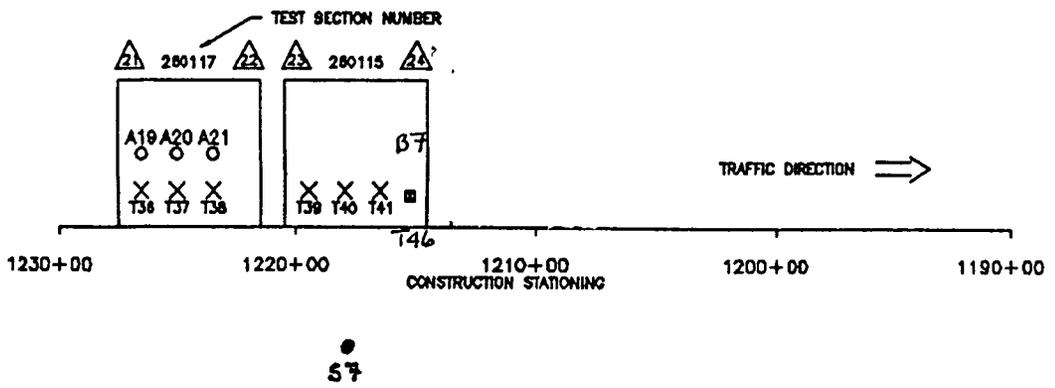
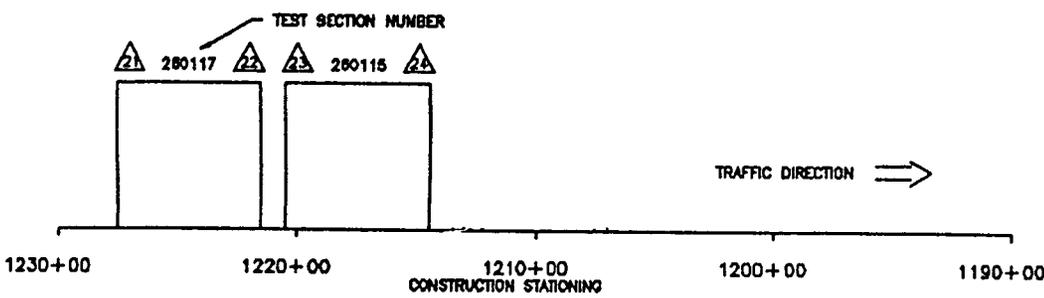
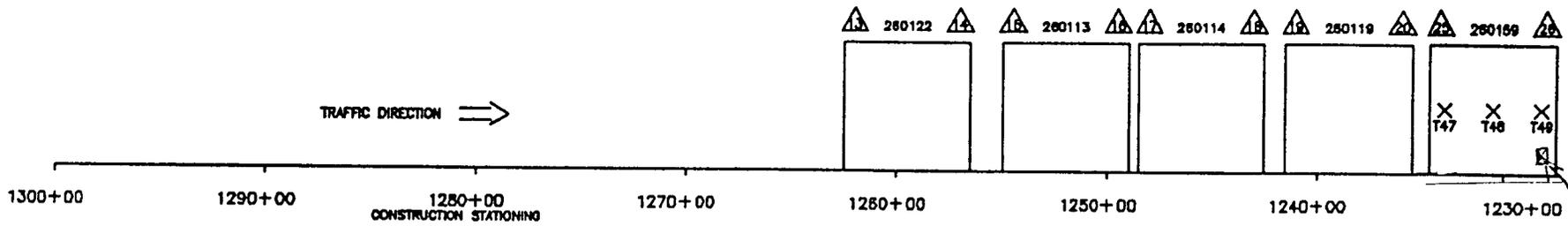
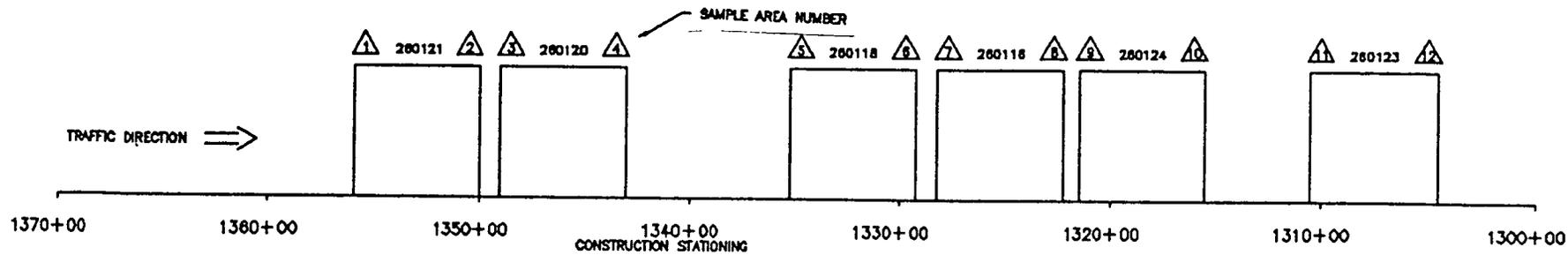


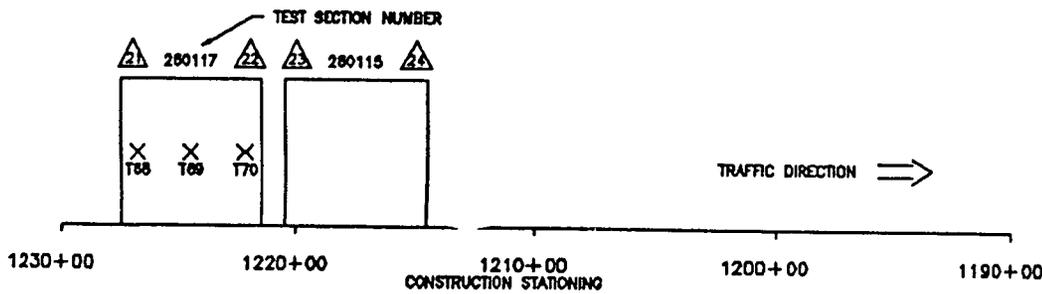
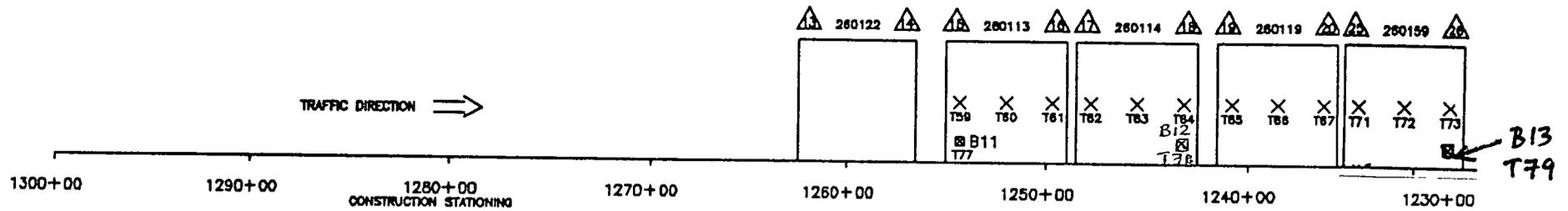
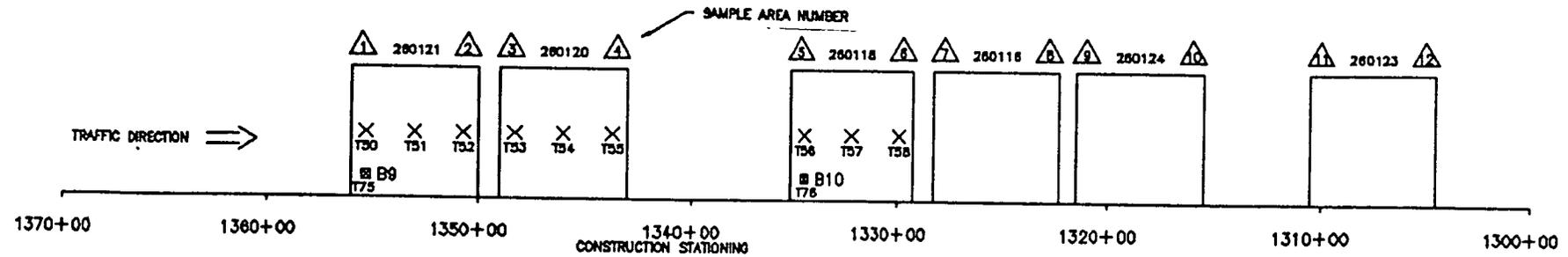
FIG. 17 - OVERVIEW OF SAMPLING AND FIELD TESTING PLAN FOR SUBGRADE (CONTROL SECTION) AND EMBANKMENT (SHRP SECTIONS)



- NOTES:**
1. EACH TEST SECTION IS 600 ft. LONG
  2. T - NUCLEAR DENSITY/MOISTURE TESTS  
B - BULK AND MOISTURE SAMPLES
  3. CONDUCT ELEVATION MEASUREMENT AND FWD TESTING ON SECTION 260159

B8  
T74

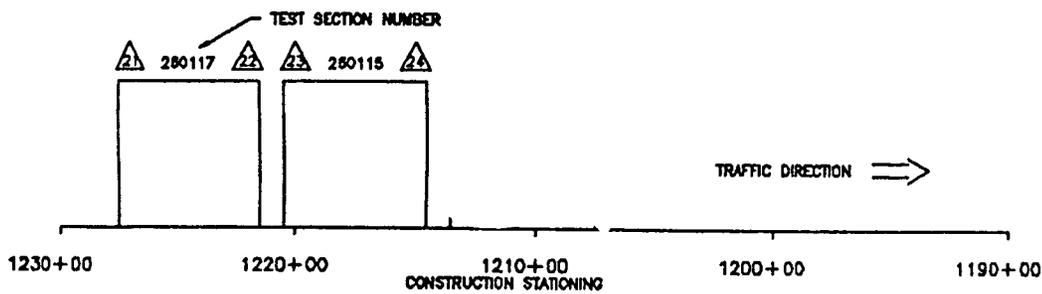
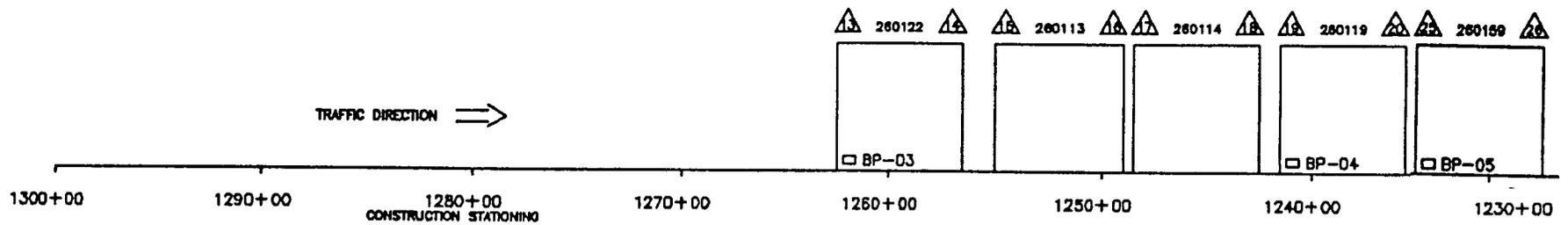
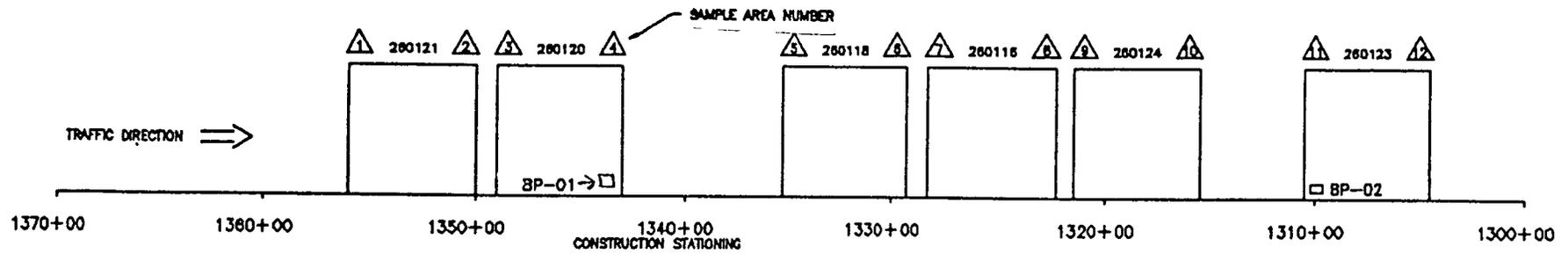
FIG. 18 - OVERVIEW OF SAMPLING AND FIELD TESTING FOR SUBBASE (CONTROL SECTION)



**NOTES:**

1. EACH TEST SECTION IS 600 ft. LONG
2. T - NUCLEAR DENSITY AND MOISTURE TESTS, B - BULK AND MOISTURE SAMPLES
3. CONDUCT ELEVATION MEASUREMENTS AND FWD TESTING ON ALL SECTIONS WITH AGGREGATE BASE
4. CONDUCT NUCLEAR DENSITY TESTS ON BULK SAMPLING LOCATIONS BEFORE SAMPLING

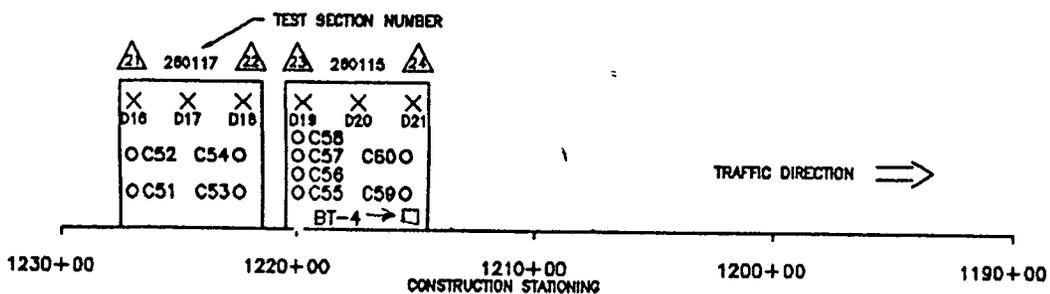
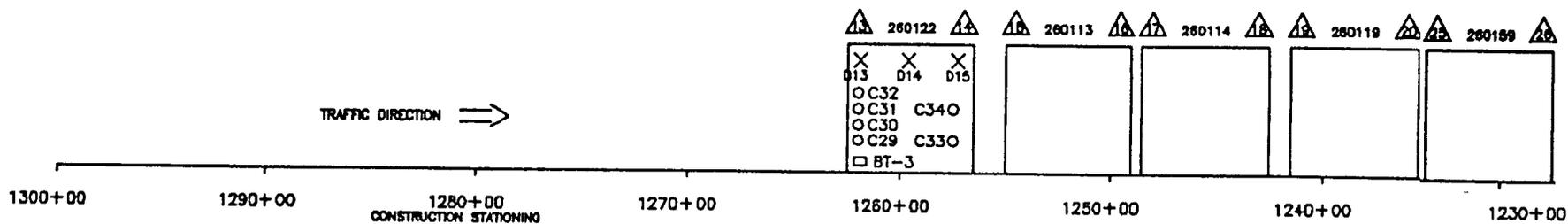
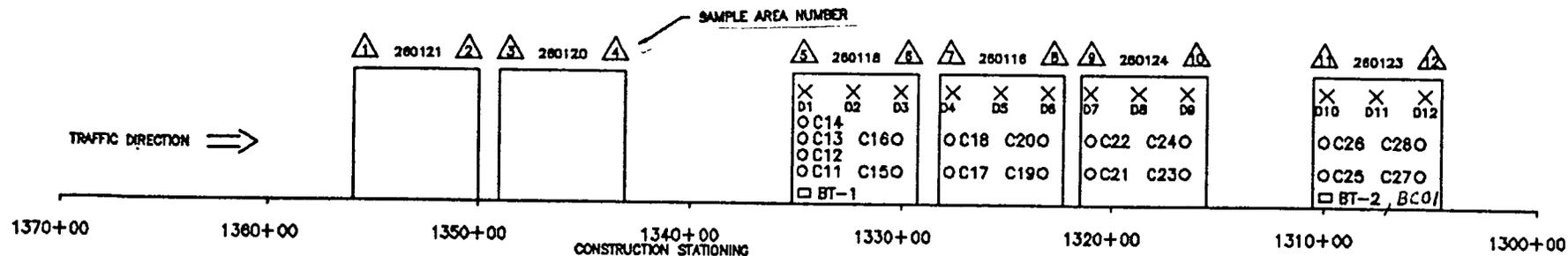
FIG. 19 - OVERVIEW OF SAMPLING AND FIELD TESTING PLAN FOR AGGREGATE BASE



**NOTES:**

1. EACH TEST SECTION IS 600 ft. LONG
2. BP - BULK SAMPLES, FROM PAVER
3. CONDUCT ELEVATION MEASUREMENTS AND FWD TESTING ON ALL SECTIONS WITH PATB

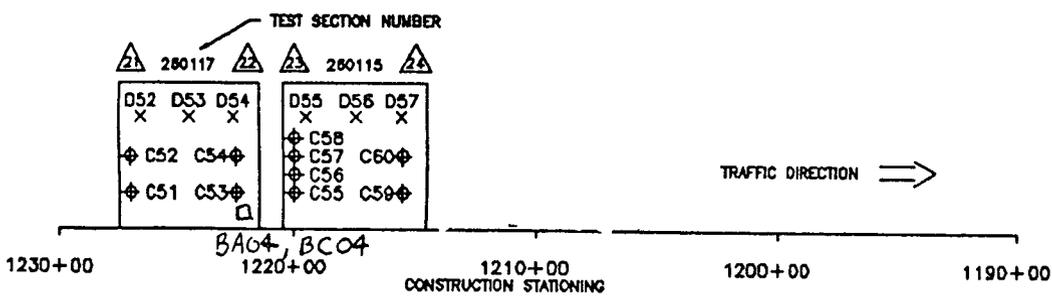
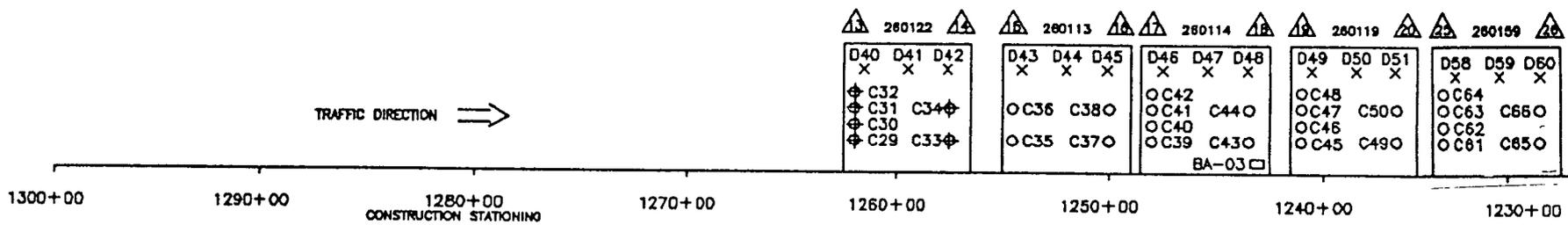
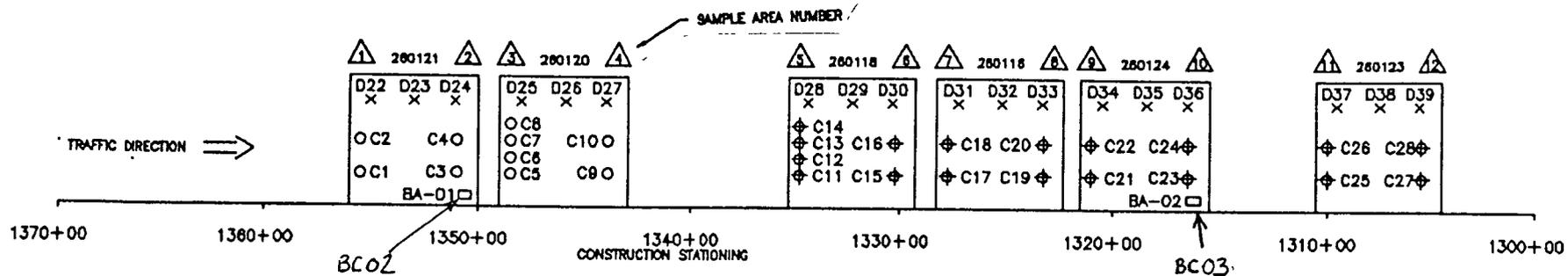
FIG. 20 - OVERVIEW OF SAMPLING AND FIELD TESTING PLAN FOR PATB



**NOTES:**

1. EACH TEST SECTION IS 600 ft. LONG
2. BT - BULK SAMPLES, C - CORES  
D - NUCLEAR DENSITY TESTS
3. OBTAIN CORES FROM ATB WHEN CORING FOR ASPHALT CONCRETE

FIG 21 - OVERVIEW OF SAMPLING AND FIELD TESTING PLAN FOR ATB



○ CORE FROM AC ONLY  
 ⊕ CORE FROM AC AND ATB

**NOTES:**

1. EACH TEST SECTION IS 600 ft. LONG
2. C - CORES, BA - BULK SAMPLES  
D - NUCLEAR DENSITY TESTS
3. OBTAIN BULK SAMPLES OF ASPHALT CONCRETE FROM EACH ASPHALT CONCRETE MIX AT SPECIFIED LOCATIONS. ADD THE FOLLOWING SUFFIX TO THE SAMPLE NUMBER ACCORDING TO THE LAYER: L1 - FIRST LEVELING, L2 - SECOND LEVELING, S - SURFACE
4. OBTAIN 3, 5 GAL. SAMPLES OF ASPHALT CEMENT FROM PLANT (BC-01, BC-02, BC-03)
5. CONDUCT NUCLEAR DENSITY TESTS AFTER EACH ASPHALT CONCRETE MIX LAYER IS COMPLETED. USE FOLLOWING SUFFIX TO TEST NUMBER (e.g. D53) ACCORDING TO THE LAYER: L1 - FIRST LEVELING, L2 - SECOND LEVELING, S - SURFACE
6. CONDUCT ELEVATION MEASUREMENTS ON THE FINISHED AC SURFACE

FIG 22 - OVERVIEW OF SAMPLING AND TESTING FOR AC