



# **INSPECTORS HANDBOOK**

**ENGLISH EDITION  
(ISSUED DECEMBER 2007)**

## **MDOT INSPECTORS MANUAL**

### **PREFACE**

As an inspector for the Mississippi Department of Transportation, you perform a vital function for the people of our State. Since the Project Engineer will usually be responsible for several jobs simultaneously and has limited time to spend on any one project, you will be relied upon to insure that quality material is incorporated into quality construction—in short, that we get what we pay for.

This booklet is intended to assist you in that function by allowing you to have adequate sampling information in a quick reference format. You should become familiar with its contents and request clarification from the Project Engineer on any questions that arise.

Remember that all material used on a project requires acceptance by the Department and that some form of paperwork should accompany each shipment of material delivered to a project. This paperwork may be a letter of certification, mill test report, shipping ticket, bill of lading, etc. A complete copy of all required documentation should be obtained for the Project Engineer.

While the booklet contains general information relative to normal sampling procedures and frequencies, occasionally some peculiarity may require procedures or frequencies applicable only to a particular project. These times will be indicated in the contract and you should determine from the Project Engineer whether or not you have any items requiring special consideration.

**TABLE OF CONTENTS**

|   |   |           |
|---|---|-----------|
| <b>PREFACE</b>  | .....   | <b>2</b>  |
| <b>PART I: Materials Sampling Procedures</b>  | .....   | <b>5</b>  |
|   | Aggregates  |           |
|   | Agricultural Limestone  |           |
|   | Bituminous Materials  |           |
|   | Brick   |           |
|   | Calcium Chloride  |           |
|   | Cement and Fly Ash  |           |
|   | Chain Link Fencing  |           |
|   | Concrete  |           |
|   | Densities   |           |
|   | Gates   |           |
|   | Geotextile Fabrics  |           |
|   | Granular Material   |           |
|   | Hot Bituminous Pavements  |           |
|   | Hydrated Lime   |           |
|   | Preformed Joint Material  |           |
|   | Raised Pavement Markers and Bituminous Adhesive   |           |
|   | Reinforcing Steel   |           |
|   | Seeds for Roadside Development  |           |
|   | Tension Wire and Tie Wire   |           |
|   | Topsoil   |           |
|   | Water   |           |
|   | Wire Mesh (Steel Wire Fabric)   |           |
|   | Woven Wire and Barbed Wire  |           |
| <b>PART II: Job Control Sampling and Testing</b>  | .....   | <b>13</b> |
| <b>PART III: Approximate Frequencies for Job Control Acceptance Sampling and Testing (TMD 20-04-00-000)</b> | .....   | <b>15</b> |
| <b>PART IV: Sampling and Testing of Small Quantities of Miscellaneous Materials (TMD 20-05-00-000)</b>      | .....   | <b>47</b> |
| <b>PART V: Sampling and Lot Sizes (TMD 20-03-00-000)</b>  | .....   | <b>50</b> |
| <b>PART VI: Material Certification</b>  | .....   | <b>56</b> |
|   | Mississippi Standard Specifications for Road and Bridge Construction<br>Section 700.05—Material Certifications and Certified Test Reports |           |
|   | Materials Requiring Certification (Chart)   |           |

|                   |   |              |           |
|-------------------|---|--------------|-----------|
| <b>PART VII:</b>  | <b>Appendix A, Materials Operating Procedures</b>                   | <b>.....</b> | <b>60</b> |
| <b>PART VIII:</b> | <b>Appendix B, Construction Tables and Charts</b>                   | <b>.....</b> | <b>81</b> |
| <b>PART IX:</b>   | <b>Appendix C, Concrete Field Test Methods (Print Edition Only)</b> |              | <b>92</b> |

**PART I**  
**MATERIALS SAMPLING PROCEDURES**

## MATERIAL SAMPLING PROCEDURES

### AGGREGATES

1. **Sampling from bins.** A sufficient amount of material should be allowed to flow from the bin to insure normal uniformity before the sample is selected. A sample from the entire cross-section of flow of material is obtained by placing the sample catcher under the flowing aggregate until full. The sample is then placed into a clean sample sack.
2. **Sampling from trucks or railroad cars.** The surface area should be divided into quarters. The top 6 inches of the material should be removed from the area to be sampled. Equal portions should be taken from each quarter and combined into a composite sample. The composite sample may be run through a sample splitter or quartered into the specified sample size. When using the method of quartering a sample, the sample should be piled in a cone. Each shovel full is to be emptied on the center of the cone and allowed to run down equally in all directions. This will mix the sample. Flatten the cone with a shovel until the material is spread out to a uniform thickness. Work the flat pile into quarters and reject two opposite quarters. Mix again by shoveling the material into a conical pile, taking alternate shovels full from the two quarters saved. Continue the process (piling, flattening, quartering, and rejecting two quarter) until the sample is reduced to the required size.
3. **Sampling from a conveyor belt.** The Inspector will need two dividers shaped to fit the contour of the conveyor belt. With the belt loaded and stopped, push one of the dividers down through the material to the belt. Estimate the distance between the dividers necessary to obtain the required amount of material and place the second divider. Remove **all** of the material between the dividers and place into a clean sample sack. It may be necessary to use a brush to get all of the fines off the belt.
4. **Sampling from a stockpile.** This probably the most difficult yet common method of obtaining samples of aggregates. The Inspector should visually inspect the stockpile, and randomly select three points which will adequately represent the material in the stockpile. One point should be selected near the base, one at or near the mid point and one near the top of the pile. Rake down the material approximately six inches to one foot, then obtain equal portions from the three locations and combine into a composite sample. The composite sample may be run through a sample splitter or quartered (See No. 2 above) into the specified sample size. Note—for coarse aggregate it will be necessary to push a board into the stockpile above each sampling point to

prevent the aggregate above the sampling point from rolling down and contaminating the sample with coarser particles. The material is then raked down six inches to one foot just beneath the board.

## **AGRICULTURAL LIMESTONE**

This material is sampled in the same manner as aggregate.

NOTE: Limestone samples should be clearly identified as being Agricultural Limestone or a marl or chalk for testing as designated by the current Mississippi Agricultural Liming Act published by the Mississippi Department of Agriculture. A copy of the material certification showing the material type can be obtained from the contractor.

## **BITUMINOUS MATERIALS**

1. **Sampling from a storage tank.** Samples may be obtained from a sample valve in the storage tank or the circulating line. At least one gallon should be drawn through the valve prior to taking the sample. Place the sample in the appropriate clean, dry, quart-sized sample container. If the tank does not have a sampling valve, the sample may be obtained with a thief sampler. The place the sample of bituminous material in the appropriate clean, dry sample container.
2. **Sampling from tank cars, tank trucks or distributor trucks.** Sampling may be performed in the same manner as for storage tanks.

NOTE: When samples of **hot** bituminous material are obtained, the sample container shall be filled completely full to minimize condensation.

NOTE: It is **not** recommended that samples be obtained from the unloading line.

## **BRICK**

Samples will be taken at random for each color and size of brick in each shipment.

## **CALCIUM CHLORIDE**

The sample will be taken at random for each shipment of calcium chloride. Place the sample in a clean triple seal quart can.

### **CEMENT AND FLY ASH**

Samples may be obtained by a slotted tube sampler or at the point of discharge from tanks or bins. The sample should be taken from material close to the center of the load and then placed into a clean one gallon triple seal can.

### **CHAIN LINK FENCING**

A three (3) linear foot sample of the chain link fabric will be obtained at random for each size and type from each shipment. Wood post and braces shall be pretested.

One metal post shall be sent to Central Lab for each size used, and a certified test report with notes stating domestic origin of steel used shall be furnished with each shipment. See TMD-20-04-00-00, Item 607, for other materials' requirements.

### **CONCRETE**

Fresh concrete will be sampled and tested in accordance with the procedures for quality assurance of concrete. Refer to Mississippi Standard Specifications for Road and Bridge Construction, Section 804—Concrete Bridges and Structures.

### **DENSITIES**

All densities shall be performed in accordance with MT-8, MT-9, MT-10 and MT-16.

### **GATES**

Gates shall be accepted by manufacturer's certification and field measurements.

### **GEOTEXTILE**

A sample of five (5) square yards shall be selected at random, from each lot, for each type in each shipment. A manufacturer's certification shall be obtained for each lot represented in the shipment.

NOTE: Types I through III do not require a sample, but do require a manufacturer's certification. All acceptance testing shall be performed prior to incorporating the material in the work.

## **GRANULAR MATERIAL**

**The selection of the sample site on the roadway shall be performed as specified for random sampling (Appendix B).** A sufficient quantity of material shall be obtained to perform the required tests. Precaution must be taken to prevent contamination with underlying material.

## **HOT BITUMINOUS PAVEMENTS**

Refer to the “Field Manual for Hot Mix Asphalt”

## **HYDRATED LIME**

### **1. Sampling bulk hydrated lime form trucks, rail cars, silos or storage bins.**

These samples may be obtained from a conveyor belt, the point of discharge, by scoop or dip method, or by the use of a sampling tube. A half-gallon sample shall be obtained and placed in a plastic bag and then placed in a clean, dry moisture-tight, gallon container.

NOTE: In lieu of placing in a plastic bag, the sample may be placed in a clean one-gallon triple seal can.

### **2. Sampling bagged hydrated lime.**

If available, a sampling probe will be used. The probe should be inserted through the bag loading spout and pushed diagonally into the lime to obtain a representative sample. A sufficient number of sacks should be sampled to form a composite half-gallon sample. The composite sample should be placed in a plastic bag and then place din a clean, dry, moisture-tight gallon container.

If a sample probe is not available, the sacks will be opened, the top portion removed, and the sample obtained from the center portion of the sack.

NOTE: When quick lime is used, a plastic bag shall be used inside the gallon container with an air-and water-tight seal

## **PREFORMED JOINT MATERIALS**

**1. Sampling bituminous fiber type joint materials that have not been pretested.**

When possible, select a sample at random that is approximately 1' X 3'. Otherwise, select a sufficient amount of material so that five (5) samples measuring 4"X4" may be obtained. Reject and do not sample sheets that are obviously not penetrated.

**2. Sampling wood joint materials that have not been pretested.**

Sampling of wood joint material will be selected at random. Each sample will be at least three (3) linear feet and represent not more than 1000 linear feet of each depth and thickness.

## **RAISED PAVEMENT MARKERS AND BITUMINOUS ADHESIVE**

At the time of sampling raised pavement markers and adhesive, when applicable, the Contractor will furnish an original and three copies of the manufacturer's certified test reports. Refer to Mississippi Standard Specifications for Road and Bridge Construction, Section 720.03, Raised Pavement Markers.

Ten (10) markers of each type and class, selected at random, will constitute a representative sample for each lot regardless of lot size. A resample will consist of twice as many markers as originally sampled.

A minimum of ten (10) pounds of bituminous adhesive per lot or batch received shall be sampled and submitted of the Central Laboratory for testing. This may be submitted in the form of an adhesive testing package from each batch or material obtained from a package shipped to the project.

**Pretested bituminous adhesive containers must contain an Inspector's stamp. Quantity used from each different lot must be recorded for tests reports to be requested or shipping reports entered into SiteManager.**

## **REINFORCING STEEL**

If not pretested, a 30" (add 6" for each end cut with a torch) sample selected at random shall be obtained for each grade and size of reinforcing steel from each steel manufacturer. The manufacturer's identification markings shall be on each sample submitted. One sample is required for each ten (10) tons or fraction thereof for each size bar.

## **SEEDS FOR ROADSIDE DEVELOPMENT**

Seed that has not been sampled and tested by the Mississippi Department of Agriculture and Commerce and test reports furnished prior to planting, shall be sampled by the Department and tested for the germination requirements.

A  $\frac{1}{4}$  pound sample of seed of each species (kind and variety) shall be obtained from each lot. A lot is defined as all the seed of each species from the same source and with the same lot identification as shown on the tag of each bag of seed in approved storage at the time of sampling. (See Materials Division Inspection, Testing, and Certification Manual—MTICM Section 2.10 in Appendix A)

The applicable trier or sampling probe shall be used in obtaining samples of seed. On lots of 6 bags or less, sample each bag. For lots containing more than 6 bags, sample 5 bags plus one random bag out of each 10 bags (or less). Example: 6-10 bags—6 samples, 11-20 bags—7 samples, etc. The probe shall be fully inserted into the container so as to obtain a representative sample of the seed. Holes made by the probe shall be sealed with pressure-sensitive tape to prevent loss or contamination of the seed.

When the composite sample of seed exceeds  $\frac{1}{4}$  pounds, the sample shall be carefully quartered down to the  $\frac{1}{4}$  sample, then placed into the Container of Seed Samples (TMD-088) and shipped to the State Seed Testing Laboratory.

## **TENSION WIRE AND TIE WIRE**

A six (6) foot sample each of tension wire and tie wire shall be selected at random from each shipment of each size wire.

## **TOPSOIL**

A minimum sample size of five (5) pounds of topsoil shall be obtained for testing. Care must be exercised on selecting the sample to ensure that it is representative of the material proposed for use.

## **WATER**

A  $1\frac{1}{2}$  pint sample of water shall be obtained from each proposed source. Care shall be exercised in sampling to ensure that it is representative of the water proposed for use.

**WIRE MESH (Steel Wire Fabric)**

If not pretested, a 3'X 3' sample of the wire mesh shall be taken from a roll selected at random for each 100 rolls or fraction thereof. Each roll of wire mesh shall have a tag attached which gives the name of the manufacturer and a description of the material. (See MTICM Section 2.3.2 in Appendix A)

**WOVEN WIRE AND BARBED WIRE**

1. A three (3) linear foot sample of woven wire shall be obtained from a roll selected at random for each fifty (50) rolls or fraction thereof.
2. A twenty-five (25) linear foot sample of barbed wire shall be obtained from a roll selected at random for each fifty (50) rolls or fraction thereof.

**PART II**

**JOB CONTROL SAMPLING AND TESTING**

## **Job Control Sampling and Testing**

*(Materials Division Inspection, Testing, and Certification Manual, Section 4.2)*

### **4.2.1 Job Control Sampling and Testing**

**4.2.1.1 General** – To outline uniform procedures for job control of materials and operations.

#### **4.2.1.2 Purpose of Testing Materials**

All testing of materials has several purposes, among which are:

- (1) To assure that materials comply with specifications.
- (2) To indicate corrective action necessary.
- (3) To improve materials and construction control.
- (4) To provide data for statistical analysis as a basis for revision of the specifications.
- (5) To promote awareness of the importance of optimum quality materials and proper methods of construction.

Job Control sampling and testing is that performed on a day-to-day basis during construction and after completion of any phase of construction. This sampling and testing may be performed by project personnel, district laboratory personnel, the Central Laboratory, commercial laboratories, and, in some cases, by manufacturers' laboratories.

Whenever a test indicates noncompliance with the specifications, several steps may be taken:

- (1) Retest the sample or obtain a check sample and test;
- (2) Notify the Contractor so that corrective action may be taken;
- (3) Notify the Project Engineer, District Materials Engineer, or State Materials Engineer.

All test results shall be retained. When a test indicates failure, the project records shall indicate the corrective action taken and shall include both the failing test data as well as the complying test data after corrections have been made.

It is required that all basic data, from which test results are computed, be retained in project files. This includes wet and dry weight in moisture determinations, retained weights in gradation tests, and similar data for other tests. It also includes both laboratory and field testing.

Job control sampling and testing is applicable to all materials, processes, construction operations, and includes field determinations of specification requirements, such as in-place densities, depth and width measurements, and other tests which inherently require testing in-place.

These provisions are applicable to all materials on all projects, except that, when the quantity of a material on a given project is insufficient to justify the expense of testing, the District Materials Engineer or the State Materials Engineer may determine that no job control samples will be required for these materials within the guidelines of documents cited in Section 4.2.2.2 of this document.

**PART III**

**APPROXIMATE FREQUENCIES FOR JOB  
CONTROL ACCEPTANCE AND TESTING  
(TMD-20-04-00-000)**

# MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

S.O.P. No.: **TMD-20-04-00-000** Mississippi Department of Transportation - Standard Operating Procedures

Subject: **APPROXIMATE FREQUENCIES FOR JOB CONTROL ACCEPTANCE SAMPLING AND TESTING**

Effective Date: **August 28, 2007**  
Issued Date: **August 28, 2007**

|                                       |                       |
|---------------------------------------|-----------------------|
| Supersedes S.O.P.<br>TMD-20-04-00-000 | Dated<br>May 01, 2005 |
|---------------------------------------|-----------------------|

**PURPOSE:** To establish a complete schedule for uniform job control acceptance sampling and testing.

The following schedule sets forth the sample size, frequency of sampling and designates the responsibility for sampling and testing. Any sampling and/or testing not performed by the Central Laboratory will be the responsibility of the District. The District may perform these operations or assign them to the Project Engineer as desired.

The frequencies in this schedule will be used by the Central Laboratory to ascertain the quantities of tested materials, unless otherwise stipulated in the Proposal. The responsibility for compliance with this schedule rests with the District and/or Project Engineer; however, additional sampling and testing may be performed as deemed necessary.

At the discretion of the Project Engineer, a residual portion of a lot completed during a day's operation may be considered as a separate lot or may be included in the previous or subsequent lot.

When samples are designated to be obtained by the District, these materials are normally located on or near the project site.

Pretested materials are normally sampled at the producer's plant or at a broker's warehouse.

The Office of State Aid Road Construction will be responsible for administering the frequencies of sampling and testing, at their discretion.

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM   | MATERIAL OR TEST                | FREQUENCY   | SAMPLED BY | TESTED BY |
|----------|--|---------------------------------|---|------------|-----------|
| 203      | Borrow Excavation                                      | Quality                         | Source Approval   | District   | District  |
|          | Excavation & Embankment                                | Density                         | See Note (1)  | District   | District  |
| 204      | Geogrid Reinforcement of Embankment Slopes & Subgrades | Geogrids                        | Manufacturer's Certification, Certified Test Report Each Lot & 5 S.Y. Sample Each Shipment, Each Type; MDOT APL | District   | Jackson   |
| 206      | Structure Excavation (Backfill)                        | Density                         | Within the upper one-half of each 4' depth of back-fill See Note (6)  | District   | District  |
| 209      | Geotextile Stabilization                               | Geotextile                      | Mfgr's Certification & 5 S.Y. Sample Each Lot, Each Shipment, Each Type   | District   | Jackson   |
| 211      | Topsoiling   | Topsoil for Slope Treatment     | Source Approval   | District   | District  |
|          |  | Topsoil for Plant Holes or Pits | Source Approval   | District   | Jackson   |
| 212      | Ground Preparation                                     | Depth                           | As Required   | District   | District  |
|          |  | Pulverization                   | As Required   | District   | District  |
| 213      | Fertilizing  | Commercial Fertilizer           | Guaranteed Analysis   |            |           |
|          |  | Agricultural Limestone          | 1 Gal. Sample each 50 tons  | District   | Jackson   |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                          | MATERIAL OR TEST                     | FREQUENCY   | SAMPLED BY | TESTED BY              |
|----------|-------------------------------|--------------------------------------|---|------------|------------------------|
| 214      | Seeding                       | Seed                                 | Certified Analysis on Each Bag (Germination Report Required)            |            |                        |
|          |                               |                                      | If not Pretested, 1/4 lb. Sample for each Lot                           | District   | State Seed Testing Lab |
| 215      | Vegetative Material for Mulch | Mulch                                | Visual Inspection   | District   | District               |
|          |                               | Asphalt                              | Manufacturer's Certification each Shipment                              |            |                        |
| 216      | Solid Sodding                 | Sod                                  | Visual Inspection; If kind of sod is specified it must be nursery grown | District   | District               |
| 217      | Ditch Liner                   | Blanket, Fabric, Jute Mesh & Staples | Manufacturer's Certification each Shipment                              |            |                        |
| 218      | Bituminous Treated Roving     | Roving                               | Manufacturer's Certification each Shipment                              |            |                        |
|          |                               | Emulsified Asphalt                   | See Note (2)  | District   | Jackson                |
| 219      | Watering                      | Water                                | 1 1/2 Pint Sample each Source   | District   | Jackson                |
| 221      | Paved Ditches                 | Concrete, Etc.                       | See Item No. 601  |            |                        |
|          |                               | Bituminous Materials                 | See Item No. 403  |            |                        |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                    | MATERIAL OR TEST        | FREQUENCY  | SAMPLED BY | TESTED BY              |
|----------|-------------------------|-------------------------|--|------------|------------------------|
| 224      | Soil Reinforcing Mat    | Mat                     | Manufacturer's Certification;<br>MDOT APL  |            |                        |
|          |                         | Pins, Staples           | Manufacturer's Certification   |            |                        |
| 225      | Grassing                | Fertilizer              | Guaranteed Analysis  |            |                        |
|          |                         | Seeds                   | Certified Analysis on Each Bag<br>(Germination Report Required)                                |            |                        |
|          |                         |                         | If not Pretested, 1/4 lb. Sample for each Lot  | District   | State Seed Testing Lab |
|          |                         | Agricultural Limestone  | 1 Gallon sample per 50 tons  | District   | Jackson                |
|          |                         | Mulch                   | Visual Inspection  | District   | District               |
|          | Emulsified Asphalt      | See Note (2)            | District   | Jackson    |                        |
| 230      | Tree and Shrub Planting | Plants                  | Certification of Inspection from Nursery & Visual Inspection by Authorized MDOT Representative |            |                        |
|          |                         | Water                   | 1-1/2 Pint Sample each Source  | District   | Jackson                |
|          |                         | Topsoil for Plant Holes | Source Approval  | District   | Jackson                |
|          |                         | Fertilizer              | See Item No. 232   |            |                        |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                                | MATERIAL OR TEST              | FREQUENCY  | SAMPLED BY | TESTED BY |
|----------|-------------------------------------|-------------------------------|--|------------|-----------|
|          |                                     | Mulch                         | See Item No. 233   |            |           |
| 231      | Tree Seeding Planting               | Plants                        | Certificate of Inspection from Nursery & Visual Inspection by Authorized MDOT Representative |            |           |
|          |                                     | Fertilizer                    | See Item Nos. 213 or 232 as Specified  |            |           |
| 232      | Fertilizer for Woody Plant Material | Fertilizer (Packet or Tablet) | Guaranteed Analysis  |            |           |
| 233      | Mulch for Woody Plant Material      | Tree Bark                     | Guaranteed Analysis  |            |           |
|          |                                     | Aggregate                     | Source Approval  | District   | District  |
|          |                                     | Straw                         | Visual Inspection  | District   | District  |
| 234      | Silt Fence                          | Fabric                        | Manufacturer's Certification & Supplier's Material Conformance Statement, Each Lot           |            |           |
|          |                                     | Posts, Wire Backing, Staples  | Visual Inspection  | District   | District  |
| 235      | Temporary Erosion Checks            | Baled Hay or Straw            | Visual Inspection  | District   | District  |
|          |                                     | Stakes                        | Visual Inspection  | District   | District  |
| 304      | Granular Material                   | Abrasion Test (Class 1-6)     | 75# Source Sample  | District   | Jackson   |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                    | MATERIAL OR TEST                       | FREQUENCY  | SAMPLED BY | TESTED BY                    |
|----------|-------------------------|--|--|------------|------------------------------|
|          |                         | Grad., P.I.                            | 1 each 1000 C.Y. or 1 each 1400 Tons from Roadway  | District   | District                     |
|          |                         | Density                                | Lot Size is 2500 L.F. each Layer (5 Tests per Lot) | District   | District                     |
| 305      | In-Grade Modification   | Stabilizer Aggregate                   | See Item No. 310                                   |            |                              |
|          |                         | Density                                | See Item No. 310                                   |            |                              |
| 306      | Asphalt Drainage Course | Gradation (belt sample), AC Content    | 1 per 1000 tons                                    | District   | District                     |
|          |                         | Lime                                   | ½ Gal. Initial Sample                              | District   | Jackson                      |
|          |                         | Asphalt Cement (PG Binder Tests)       | 1 Qt. per 200,000 gallons; Cert. A                 | District   | Jackson                      |
| 307      | Lime Treated Course     | Mix Design                             | 150# Sample for each Type Soil                     | District   | Jackson                      |
|          |                         | Lime                                   | 1 Gal. each 1000 Tons                              | District   | Jackson                      |
|          |                         | Water                                  | 1-1/2 Pint each Source                             | District   | Jackson                      |
|          |                         | Density                                | Lot Size is 2500 L.F. each Layer (5 Tests per Lot) | District   | District                     |
|          |                         | Pulverization                          | As Required  | District   | District                     |
|          |                         | Soil-Lime Mixture (Dry Quicklime only) | % Hydration (Cert. Test Report) from test strip    | District   | Contractor (Independent Lab) |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                            | MATERIAL OR TEST    | FREQUENCY   | SAMPLED BY | TESTED BY |
|----------|---------------------------------|---------------------|---|------------|-----------|
|          |                                 | Curing Seal (Prime) | See Note (2)  | District   | Jackson   |
| 308      | Portland Cement Treated Courses | Mix Design          | 150 lb. Sample for each Type Soil                       | District   | Jackson   |
|          |                                 | Water               | 1-1/2 Pint each Source                                  | District   | Jackson   |
|          |                                 | Cement              | Cert. A or B & 1 Gal. Sample each 1000 Bbls.; MDOT APL  | District   | Jackson   |
|          | After Mixing                    | Curing Seal (Prime) | See Note (2)  | District   | Jackson   |
|          |                                 | Pulverization       | As Required   | District   | District  |
|          |                                 | Density             | Lot Size is 2500 L.F. each Layer (5 Tests per Lot)      | District   | District  |
| 309      | Crushed Stone Drainage Layer    | Aggregate           | 75 lb. Initial Sample; MDOT APL                         | District   | Jackson   |
|          |                                 | Gradation           | 1 per 1000 C.Y., or 1 per 1400 tons, or 1 per 9000 S.Y. | District   | District  |
| 310      | Mechanically Stabilized Courses | Aggregates          | 75 lb. Initial Sample                                   | District   | Jackson   |
|          |                                 | Grad. of Agg.       | 1 each 300 C.Y. or 400 tons; Project Site               | District   | District  |
|          | After Mixing                    | Grad. & P.I.        | 1 each 1000 L.F.  | District   | District  |
|          |                                 | Density             | Lot Size is 2500 L.F. each Layer (5 Tests per Lot)      | District   | District  |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                        | MATERIAL OR TEST             | FREQUENCY  | SAMPLED BY | TESTED BY |
|----------|-----------------------------|------------------------------|--|------------|-----------|
| 311      | Lime-Fly Ash Treated Course | Mix Design                   | 300 lb. Sample for each Type Soil, 50 lb. Fly Ash  | District   | Jackson   |
|          |                             | Lime                         | 1 Gal. each 1000 Tons                              | District   | Jackson   |
|          |                             | Fly Ash                      | Certification & 1 Gal. each 4000 Tons; MDOT APL    | District   | Jackson   |
|          |                             | Water                        | 1-1/2 Pint each Source                             | District   | Jackson   |
|          |                             | Density                      | Lot Size is 2500 L.F. each Layer (5 Tests per Lot) | District   | District  |
|          |                             | Pulverization                | As Required  | District   | District  |
|          |                             | Curing Seal (Prime)          | See Note (2)                                       | District   | Jackson   |
| 320      | Shoulders                   | Abrasion Test Class (1-6)    | 75 lb. Source Sample, Annually                     | District   | Jackson   |
|          |                             | Grad., P.I.                  | 1 each 1000 C.Y. or 1 each 1400 Tons from Roadway  | District   | District  |
|          |                             | Density                      | See Note (4)                                       | District   | District  |
| 321      | In-Grade Preparation        | Density (Top of Design Soil) | 1 each 1000 L.F.                                   | District   | District  |
|          |                             | Density (Other Courses)      | See Item No. for Applicable Course                 | District   | District  |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO.  | ITEM            | MATERIAL OR TEST                             | FREQUENCY   | SAMPLED BY             | TESTED BY                       |
|-----------|-----------------|--|---|------------------------|---------------------------------|
| 403       | Hot Mix Asphalt | Mix Design                                   | Each mix; as Req'd by Section 401 of Standard Specifications & MITCM; See Note (13) | Contractor             | Contractor; verified by Jackson |
|           |                 | Hydrated Lime                                | 1/2 Gal. Initial Sample, per source   | District               | Jackson                         |
|           |                 | Aggregates                                   | MDOT APL or Source Approval   | District or Contractor | Jackson                         |
|           |                 | Crushing Requirements (fractured face count) | One per Day/Production  | Contractor             | Contractor                      |
|           |                 | Asphalt Cement (temp., viscosity)            | One qt. per 100,000 gal.  | District               | District                        |
|           |                 | Asphalt Cement (PG binder tests)             | One qt. per 200,000 gal.; Certificate A or B  | District               | Jackson                         |
|           |                 | Tack Coat                                    | See Note (2)  | District               | Jackson                         |
|           |                 | Gradation of Mineral Aggregates, Stockpiles  | See Note (3)  | Contractor             | Contractor                      |
|           |                 | Gradation of Mixture, extraction             | See Note (3)  | Contractor             | Contractor; District            |
|           |                 | VMA & Total Voids                            | See Note (3)  | Contractor             | Contractor; District            |
|           |                 | Road Density, HMA Field Manual Chapter 7     | See Note (10)   | District               | District                        |
| % Asphalt | See Note (3)    | Contractor                                   | Contractor; District  |                        |                                 |

**Annotations:**  
**Commission Order:** 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                                   | MATERIAL OR TEST                 | FREQUENCY   | SAMPLED BY | TESTED BY  |
|----------|--|----------------------------------|---|------------|------------|
|          |  | Stripping Test (MT-59 and MT-63) | Initial; then One per Two Weeks Production                            | Contractor | Contractor |
|          |  | Surface Checks                   | As Required   | District   | District   |
| 404      | Cold Bituminous Pavements              | Extraction                       | 1 each 400 Tons If Not Pretested; MDOT APL                            | District   | District   |
| 407      | Tack Coat                              | Asphalt                          | See Note (2)  | District   | Jackson    |
| 408      | Prime Coat                             | Asphalt                          | See Note (2)  | District   | Jackson    |
| 409      | Geotextile for Underseal               | Asphalt                          | See Note (2)  | District   | Jackson    |
|          |  | Geotextile                       | Manufacturer's Certification & 5 S.Y. Sample, Each Lot, Each Shipment | District   | Jackson    |
| 410      | Bituminous Surface Treatment           | Asphalt                          | See Note (2)  | District   | Jackson    |
|          |  | Aggregate                        | 75 lb. Initial Sample each Aggregate; MDOT APL                        | District   | Jackson    |
|          |  | Gradation                        | 1 each 300 C.Y.   | District   | District   |
| 413      | Cleaning and Sealing Joints and Cracks | Bituminous Material              | See Note (2)  | District   | Jackson    |
|          |  | Hot-Poured Elastic Type          | Manufacturer's Certified Test Report each Lot                         |            |            |
|          |  | Silicone                         | Manufacturer's Certified Test Report each Lot & MDOT APL              |            |            |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                              | MATERIAL OR TEST      | FREQUENCY   | SAMPLED BY | TESTED BY |
|----------|-----------------------------------|-----------------------|---|------------|-----------|
|          |                                   | Backer Rod            | 3 L.F. Sample each Shipment & MDOT APL                              | District   | Jackson   |
|          |                                   | Aggregate (Gradation) | 75 lb. Initial Sample; MDOT APL                                     | District   | District  |
| 501      | Portland Cement Concrete Pavement |                       |   |            |           |
|          |                                   | Mix Design            | Approval  | Contractor | Jackson   |
|          |                                   | Aggregate             | 75 lb. Sample each Aggregate; MDOT APL                              | District   | Jackson   |
|          |                                   | Gradation             | See Note (5)  | District   | District  |
|          |                                   | Cement                | Cert. A or B & 1 Gal. each 1000 C.Y. Concrete Production; MDOT APL  | District   | Jackson   |
|          |                                   | Water                 | 1-1/2 Pint Sample each Source                                       | District   | Jackson   |
|          |                                   | Admixtures            | MDOT APL & Notarized Certificate from Producer for each Batch       |            |           |
|          |                                   | Joint Filler          | Pretested   |            |           |
|          |                                   | Curing Material       | Pretested   |            |           |
|          |                                   | Fly Ash               | Certification & 1 Gal. each 4000 C.Y. Concrete Production; MDOT APL | District   | Jackson   |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                                | MATERIAL OR TEST                                 | FREQUENCY   | SAMPLED BY | TESTED BY           |
|----------|-------------------------------------|--|---|------------|---------------------|
|          |                                     | Ground Granulated Blast Furnace Slag             | Cert. A or B; MDOT APL and 1 gal. Sample each 1000 C.Y. Concrete Production | District   | Jackson             |
|          |                                     | Reinforcing Steel & Dowels                       | Pretested, See Note (7); Domestic Origin                                    |            |                     |
|          |                                     | Bar, Mats or Steel Wire Fabric (Wire Mesh)       | Pretested or 3' x 3' Sample each 40,000 lbs; Domestic Origin                | District   | Jackson             |
|          |                                     | Cylinders  | 1 each 2000 S.Y.  | District   | District or Jackson |
|          |                                     | Slump, % Air                                     | Each Cylinder as Applicable   | District   | District            |
|          |                                     | Dowel Assemblies                                 | One 5' Section per Project  | District   | Jackson             |
|          |                                     | Silicone Sealed Joints                           |   | District   | Jackson             |
|          |                                     | Backer Rod:                                      | 3 L.F. Sample Each Shipment; MDOT APL                                       |            |                     |
|          |                                     | Joint Sealant:                                   | Certified Test Reports for each Lot & MDOT APL                              |            |                     |
|          |                                     | Dowel or Tie Bars Anchoring to Existing Pavement | See Item No. 503  |            |                     |
|          |                                     | Cores  | 1 per 1000 L.F. of 12' lane   | Jackson    | Jackson             |
| 502      | Cement Concrete Bridge End Pavement | Concrete Items                                   | See Item No. 804  |            |                     |

**Annotations:**  
**Commission Order:** 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                                  | MATERIAL OR TEST                                    | FREQUENCY  | SAMPLED BY | TESTED BY |
|----------|---------------------------------------|---|--|------------|-----------|
|          |                                       | Joint Filler  | Pretested or Certificate   |            |           |
|          |                                       | Curing Material                                     | Pretested  |            |           |
|          |                                       | Reinforcing Steel                                   | Pretested See Note (7); Domestic Origin  |            |           |
| 503      | Replacement of Concrete Pavement      | Concrete and Related Materials                      | A minimum of one set (two cylinders) per mix, per production day and strength tested at three (3) days. Slump, temperature, and total air content with each set of cylinders | District   | District  |
|          |                                       | Joint Sealant                                       | See Item 413   |            |           |
|          |                                       | Epoxy or Chemical Anchor System for Dowels/Tie Bars | Manufacturer's Certification each Shipment; MDOT APL   |            |           |
|          |                                       |   | Tension Test One per Day at Random In-Place  | District   | District  |
| 504      | Cleaning and Patching Concrete Spalls | Patching Material                                   | MDOT APL & Manufacturer's Certification; or 1 Bag each Component Including Mixing Instructions (Approved prior to use)   | District   | Jackson   |
| 508      | Silicone Sealed Joints                | Silicone  | Cert. Test Report Each lot; MDOT APL   |            |           |

**Annotations:**  
**Commission Order:** 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                                | MATERIAL OR TEST                   | FREQUENCY   | SAMPLED BY | TESTED BY |
|----------|-------------------------------------|------------------------------------|---|------------|-----------|
|          |                                     | Backer Rod                         | 3' Sample Each Shipment;<br>MDOT APL  | District   | Jackson   |
| 510      | Repair of Concrete Pavement         | Polymer Concrete                   | MDOT APL  |            |           |
| 512      | Pressure Grouting Concrete Pavement | Cement                             | Cert. A or B & 1 Gal. Sample each 1000 Bags   | District   | Jackson   |
|          |                                     | Fly Ash                            | Certification & 1 Gal. Sample each 200 Tons;<br>MDOT APL  | District   | Jackson   |
|          |                                     | Calcium Chloride                   | 1 Qt. Sample  | District   | Jackson   |
|          |                                     | Fine Aggregate                     | Source Approval   | District   | District  |
|          |                                     | Limestone Dust                     | Source Approval   | District   | District  |
|          |                                     | Water                              | 1-1/2 Pint Sample from each Source  | District   | Jackson   |
|          |                                     | Consistency                        | Each Batch  | District   | District  |
| 601      | Structural Concrete                 | Plastic Concrete                   | A minimum of one set (two cylinders) for each 50 C.Y. placed from a single supplier. Slump, temperature, and total air content with each set of cylinders | District   | District  |
|          |                                     | Mix Design and Component Materials | See 804   |            |           |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                               | MATERIAL OR TEST                                 | FREQUENCY   | SAMPLED BY | TESTED BY |
|----------|------------------------------------|--|---|------------|-----------|
|          |                                    | Precast Units                                    | Roadway Design Division<br>Approval of Shop Drawings; then<br>Pretested | Jackson    | Jackson   |
| 602      | Reinforcement                      | Reinforcing Steel                                | Pretested<br>See Note (7);<br>Domestic Origin                           |            |           |
| 603      | Culverts and Storm Drains          | Pipe (Concrete, Metal)                           | Pretested   | Jackson    | Jackson   |
|          |                                    | Bituminous Plastic Sealer                        | Pretested   | Jackson    | Jackson   |
|          |                                    | Preformed Joint Material (Flex. Plastic Gaskets) | Manufacturer's Certified Test Report                                    |            |           |
|          |                                    | Extruded Pipe (HDPE, PVC)                        | Manufacturer's Certification; MDOT APL                                  |            |           |
|          |                                    | Rubber Gaskets                                   | Manufacturer's Certified Test Report                                    |            |           |
| 604      | Manholes, Inlets, and Catch Basins | Brick  | 10 Brick Samples per 50,000 Bricks used. 5 each<br>Additional 50,000    | District   | Jackson   |
|          |                                    | Concrete   | See Item No. 601  |            |           |
|          |                                    | Reinforcing Steel                                | See Item No. 602  |            |           |
|          |                                    | Gratings   | Pretested   |            |           |
|          |                                    | Castings   | Pretested   |            |           |
|          | Precast Items:                     | Manholes   | Pretested   |            |           |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                        | MATERIAL OR TEST              | FREQUENCY   | SAMPLED BY | TESTED BY |
|----------|-----------------------------|-------------------------------|---|------------|-----------|
|          |                             | Inlets and Catch Basins       | Roadway Design Division<br>Approval of Shop Drawings; then<br>Pretested |            |           |
| 605      | Underdrains                 | Pipe:<br>(Concrete,<br>Metal) | Pretested   |            |           |
|          |                             | PVC, ABS, and<br>HDPE         | Certified Test Report &<br>Manufacturer's<br>Certification              |            |           |
|          |                             | Filter Material<br>Gradation  | 1 each 300 C.Y.   | District   | District  |
|          |                             | Geotextile                    | Manufacturer's<br>Certification,<br>Each Lot, Each<br>Type              | District   | Jackson   |
| 606      | Guard Rail                  | Metal Rail                    | Certified Test Reports; MDOT<br>APL                                     |            |           |
|          |                             | Anchorage &<br>Fittings       | Mill Test Reports   |            |           |
|          |                             | Hardware                      | Manufacturer's<br>Certification   |            |           |
|          |                             | Post, Wood                    | Pretested   |            |           |
|          |                             | Post, Metal                   | Certified Test Reports;<br>Domestic Origin                              |            |           |
| 607      | Fences and<br>Cattle Guards | Woven Wire                    | 3' Sample each<br>50 Rolls;<br>Domestic Origin                          | District   | Jackson   |
|          |                             | Barbed Wire                   | 25' Sample each<br>50 Rolls;<br>Domestic Origin                         | District   | Jackson   |

**Annotations:**  
**Commission Order:** 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM      | MATERIAL OR TEST        | FREQUENCY  | SAMPLED BY | TESTED BY |
|----------|-----------|-------------------------|--|------------|-----------|
|          |           | Staples                 | 1# Sample  | District   | Jackson   |
|          |           | Tension Wire            | 6' Sample;<br>Domestic Origin  | District   | Jackson   |
|          |           | Tie Wire                | 6' Sample;<br>Domestic Origin  | District   | Jackson   |
|          |           | Chain Link              | Certified Test Report and 3' Sample;<br>Domestic Origin  | District   | Jackson   |
|          |           | Non-Metal Post & Lumber | Pretested  |            |           |
|          |           | Gates, Aluminum Slatted | Manufacturer's Certification<br>Dimensions to be checked in field prior to erection  |            |           |
|          |           | Gates, Fabric Filled    | Manufacturer's Certification   |            |           |
|          |           | Steel Posts             | Certified Test Report and 1 Post each Size;<br>Domestic Origin   | District   | Jackson   |
|          |           | Hardware                | Manufacturer's Certification   |            |           |
| 608      | Sidewalks | Plastic Concrete        | A minimum of one set (two cylinders) for each 500 S.Y. placed from a single supplier. Slump, temperature, and total air content with each set of cylinders | District   | District  |

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                                  | MATERIAL OR TEST                            | FREQUENCY  | SAMPLED BY | TESTED BY |
|----------|---------------------------------------|---|--|------------|-----------|
|          |                                       | Mix Design and Component Materials          | See 804  |            |           |
| 609      | Concrete Curb, Gutter and Combination | Plastic Concrete                            | A minimum of one set (two cylinders) for each 900 L.F. placed from a single supplier. Slump, temperature, and total air content with each set of cylinders | District   | District  |
|          |                                       | Concrete Mix Design and Component Materials | See 804  |            |           |
|          |                                       | Bituminous Curb                             | See Item No. 403   |            |           |
|          |                                       | Paint                                       | See Item No. 625   |            |           |
| 610      | Drainage Wicks                        | Wicks                                       | Certified Test Reports; One 25 L.F. sample   | District   | Jackson   |
| 611      | Brick Masonry                         | Brick                                       | 10 Brick Samples per 50,000 Bricks, 5 Bricks each Additional 50,000  | District   | Jackson   |
|          |                                       | Masonry Cement                              | 1 Gal. each 200 Bags   | District   | Jackson   |
|          |                                       | Water                                       | 1-1/2 Pint Sample each Source  | District   | Jackson   |
|          |                                       | Mortar Sand                                 | 50 lb. Sample  | District   | Jackson   |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM   | MATERIAL OR TEST                   | FREQUENCY  | SAMPLED BY | TESTED BY |
|----------|--|------------------------------------|--|------------|-----------|
|          |  | Hydrated Lime                      | 1 Gal. Sample per 200 Bags   | District   | Jackson   |
| 613      | Adjustment of Castings, Gratings & Utility Appurtenances | Manhole Risers                     | MDOT APL   |            |           |
|          |  | All Other Materials                | See Item No. 604   |            |           |
| 614      | Concrete Driveways                                       | Plastic Concrete                   | A minimum of one set (two cylinders) for each 300 S.Y. placed from a single supplier. Slump, temperature, and total air content with each set of cylinders | District   | District  |
|          |  | Mix Design and Component Materials | See 804  |            |           |
| 615      | Concrete Barrier   | Plastic Concrete                   | A minimum of one set (two cylinders) for each 400 L.F. placed from a single supplier. Slump, temperature, and total air content with each set of cylinders | District   | District  |
|          |  | Mix Design and Component Materials | See 804  |            |           |

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                                   | MATERIAL OR TEST                            | FREQUENCY  | SAMPLED BY | TESTED BY |
|----------|--|---|--|------------|-----------|
| 616      | Median and Island Pavement             | Plastic Concrete                            | A minimum of one set (two cylinders) for each 200 S.Y. placed from a single supplier. Slump, temperature, and total air content with each set of cylinders | District   | District  |
|          |  | Concrete Mix Design and Component Materials | See 804  |            |           |
|          |  | Hot Mix Asphalt                             | See Item No. 403   |            |           |
|          |  | Joint Filler                                | Pretested  |            |           |
| 617      | ROW Markers                            | Marker                                      | Pretested  |            |           |
| 618      | Maintenance of Traffic                 | All Materials                               | See Specific Item Involved   |            |           |
| 619      | Traffic Control for Construction Zones | Paint for Traffic Stripe                    | Pretested  |            |           |
|          |  | Glass Beads                                 | Pretested  |            |           |
|          |  | Reflective Pavement Markers & Adhesive      | See Item No. 627   |            |           |
|          |  | Pavement Marking Tape                       | Manufacturer's Certification; MDOT APL   |            |           |
|          |  | New Construction Signs                      | Manufacturer's Certification or Certified Test Report  |            |           |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                           | MATERIAL OR TEST        | FREQUENCY  | SAMPLED BY | TESTED BY |
|----------|--------------------------------|-------------------------|--|------------|-----------|
|          |                                | Used Construction Signs | Visual Inspection & Certification by Project Engineer                | District   | District  |
|          |                                | Concrete Median Barrier | See Item No. 615   |            |           |
|          |                                | Impact Attenuators      | MDOT APL   |            |           |
|          |                                | Guardrail               | See Item No. 606   |            |           |
|          |                                | Snap-Back Delineators   | MDOT APL   |            |           |
|          |                                | All Other Materials     | Manufacturer's Certification   |            |           |
| 625      | Painted Traffic Markings       | Paint                   | Pretested  |            |           |
|          |                                | Beads                   | Pretested  |            |           |
| 626      | Thermoplastic Traffic Markings | Thermoplastic           | Manufacturer's Certified Test Report; MDOT APL                       |            |           |
|          |                                | Drop-on Glass Beads     | Pretested  |            |           |
| 627      | Raised Pavement Markings       | Markers                 | See Note (8); MDOT APL   |            |           |
|          |                                | Bituminous Adhesive     | Pretested or Certified test Report, 10 lb. Sample each Lot; MDOT APL | District   | Jackson   |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM  | MATERIAL OR TEST  | FREQUENCY  | SAMPLED BY   | TESTED BY  |
|----------|---|---|--|--|--|
| 628      | High Performance Cold Plastic Pavement Markings | Cold Plastic Pavement Marking   | 5' sample and Manufacturer's Certification each Lot; MDOT APL  | District   | Jackson  |
| 629      | Vehicular Impact Attenuators                    | Attenuators   | Manufacturer's Certification; MDOT APL   |  |  |
| 630      | Traffic Signs & Delineators                     | Concrete, Etc.<br><br>Wood Posts<br><br>All Metals, Etc.<br><br>Reflectorized Materials | See Item No. 601<br><br>Pretested<br><br>Manufacturer's Certified Test Report; Domestic Origin<br><br>Manufacturer's Certification; MDOT APL   |  |  |
| 631      | Flowable Fill                                   | Mix Design<br><br>Cement<br><br>Water<br><br>Fly Ash<br><br>Aggregate                   | Each<br><br>Cert. A or B; 1 gallon sample each 500 C.Y.; MDOT APL<br><br>1-1/2 pint sample each source<br><br>Cert. And 1 gallon sample each 2000 C.Y.<br><br>1 per 500 C.Y.; MDOT APL | Contractor<br><br>District<br><br>District<br><br>District | Jackson<br><br>Jackson<br><br>Jackson<br><br>Jackson<br><br>District |
| 634-686  | Traffic Signal and Illumination Systems-General | Concrete  | See Item No. 601   |  |  |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                       | MATERIAL OR TEST   | FREQUENCY  | SAMPLED BY | TESTED BY |
|----------|----------------------------|--------------------|--|------------|-----------|
|          |                            | Treated Wood       | Pretested  |            |           |
|          |                            | Other Materials    | As Required  |            |           |
| 801      | Excavation and Fill        | Density            | See Note (6)   | District   | District  |
| 802      | Sheet Piling               | Concrete           | Pretested  |            |           |
|          |                            | Steel              | Mill Test Report;<br>Domestic Origin                                     |            |           |
| 803      | Bearing Piles              | Concrete:          |  |            |           |
|          |                            | (1) Precast        | See Item No. 804   |            |           |
|          |                            | (2) Drilled Shafts | See Item No. 804   |            |           |
|          |                            | Steel              | Mill Test Report;<br>Domestic Origin                                     |            |           |
| 804      | Concrete Bridge Structures |                    |  |            |           |
|          |                            | Mix Design         | Each   | Contractor | Jackson   |
|          |                            | Cement             | Cert. A or B & 1 gal. Sample each 500 C.Y. Concrete Production; MDOT APL | District   | Jackson   |
|          |                            | Water              | 1½ Pint Each Source  | District   | Jackson   |
|          |                            | Fly Ash            | Certification & 1 gal. each 2000 C.Y. Concrete Production; MDOT APL      | District   | Jackson   |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM | MATERIAL OR TEST                     | FREQUENCY  | SAMPLED BY | TESTED BY           |
|----------|------|--------------------------------------|--|------------|---------------------|
|          |      | Ground Granulated Blast Furnace Slag | Cert. A or B; MDOT APL, and 1 gal. Sample each 1000 C.Y. Concrete Production                     | District   | Jackson             |
|          |      | Metakaolin                           | Manufacturer's Certification, MDOT APL, and 1 gal. Sample for each 2000 C.Y. Concrete Production | District   | Jackson             |
|          |      | Silica Fume                          | Manufacturer's Certification, MDOT APL, and 1 gal. Sample for each 2000 C.Y. Concrete Production | District   | Jackson             |
|          |      | Aggregates                           | See Note (11) 75 lb. Each Aggregate Initial Sample; MDOT APL                                     | Contractor | Contractor; Jackson |
|          |      | Curing Material                      | Pretested  |            |                     |
|          |      | Wire Rope or Cable                   | Certificate and 5' Sample each 100,000 L.F.; Domestic Origin                                     | District   | Jackson             |
|          |      | Spiral Wire                          | 4' Sample each Shipment; Domestic Origin   | District   | Jackson             |
|          |      | Admixtures                           | MDOT APL & Notarized Certificate from Producer for each Batch                                    |            |                     |

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                | MATERIAL OR TEST                       | FREQUENCY   | SAMPLED BY                             | TESTED BY                              |
|----------|---------------------|--|---|--|--|
|          |                     | Prestressed Concrete Beams & Piles     | Pretested & Certified by Producer; See Note (11)  | Producer (PCI Certified/MDOT Approved) | Producer (PCI Certified/MDOT Approved) |
|          |                     | Structural Steel (Joints and Bearings) | Mill Test Report; Domestic Origin   |  |  |
|          |                     | Reinforcing Steel                      | Pretested; Domestic Origin<br><br>See Note (7)  |  |  |
|          |                     | Plastic Concrete Testing               | See Note (11)   | Contractor; District                   | Contractor; District                   |
|          |                     | Neoprene Bearing Pads                  | Certificate & 1 Pad per Lot<br><br>See Note (9)   | District                               | District                               |
|          |                     | Grout, Epoxy, & Patching Material      | MDOT APL, or 1 Bag each Component including Mixing Instructions (Approved prior to use) | District                               | Jackson                                |
|          |                     | Joint Repair & Silicone Sealant        | Manufacturer's Certification; MDOT APL<br><br>See Item No. 413 and 808                  |  |  |
|          |                     | Poured Joint Sealant                   | See Item No. 501  |  |  |
|          |                     | Concrete Texture Spray Coating         | MDOT APL & Manufacturer's Certification   |  |  |
| 805      | Reinforcement Steel |  | Pretested; Domestic Origin<br>See Note (7)  |  |  |

**Annotations:**  
**Commission Order:** 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM  | MATERIAL OR TEST               | FREQUENCY  | SAMPLED BY | TESTED BY |
|----------|---|--------------------------------|--|------------|-----------|
| 806      | Precast (All Units) Concrete Bridge Caps, Spans and Wings |                                | Pretested  |            |           |
| 808      | Joint Repair  | Epoxy Joint Repair System      | MDOT APL & Manufacturer's Certification each Shipment;<br>OR<br>A Sample of each Component for Approval & then Certification each Shipment | District   | Jackson   |
| 809      | Retaining Walls   |                                |  |            |           |
|          | <b>Conventional:</b>                                      | Concrete Items                 | See Item No. 804   |            |           |
|          |   | Backfill                       | 75 lb. Initial Sample; Source Approval; Density (Ea. Lift)   | District   | District  |
|          | <b>MSE:</b>   | Precast Concrete Panels        | Cert. Test Reports (compressive strength)  |            |           |
|          |   | Modular Blocks:<br>- Materials | Manufacturer's Certification on all constituents   |            |           |
|          |   | - Compressive Strengths        | Cert. Test Reports   |            |           |
|          |   | Leveling Pads                  | A minimum of one set (two cylinders) per 200 L.F.  | District   | District  |
|          |   | Drainage Fill                  | 75 lb. Initial Sample; Source Approval   | District   | District  |

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM   | MATERIAL OR TEST                        | FREQUENCY   | SAMPLED BY | TESTED BY |
|----------|--|---|---|------------|-----------|
|          |  | Reinforced Backfill                     | Source Approval   | District   | Jackson   |
|          |  | - Density                               | 2 per lift  | District   | District  |
|          |  | Metallic Backfill Reinforcement         | Manufacturer's Certification                                      |            |           |
|          |  | Geogrids                                | Manufacturer's Certification; 5 S.Y. sample per lot, per shipment | District   | Jackson   |
|          | <b>Gravity:</b>                                    | Leveling Pad                            | A minimum of one set (two cylinders) per 200 L.F.                 | District   | District  |
|          |  | Prefab Modular Units                    | Manufacturer's Certification                                      |            |           |
|          |  | Backfill                                | 75 lb. Initial Sample; Source Approval                            | District   | District  |
|          |  | - Density                               | As required (see specifications)                                  | District   | District  |
| 810      | Steel Structures                                   | Steel                                   | Mill Test Reports   |            |           |
|          |  | Paint (Prime, Intermediate & Top Coats) | MDOT APL, Certification & 1 qt. Sample                            | District   | Jackson   |
|          |  | Bolts, Nuts, Washers & DTI's            | See Note (12)   | District   | Jackson   |
| 811      | Bronze & Copper-Alloy Bearing and Extension Plates | Metals                                  | Certified Test Reports  |            |           |
| 812      | Steel Grid Flooring                                | Steel                                   | Mill Test Reports; Domestic Origin                                |            |           |

Annotations:  
Commission Order: 121633

MDOT INSPECTORS HANDBOOK

Approved by: *Larry L. Brown*

| ITEM NO. | ITEM                                     | MATERIAL OR TEST                       | FREQUENCY  | SAMPLED BY          | TESTED BY |
|----------|--|--|--|---------------------|-----------|
| 813      | Railing                                  | Materials                              | See Applicable Items in 804  |                     |           |
| 814      | Paint Metal Structures                   | Paint (Prime, Intermediate & Top Coat) | MDOT APL, Certification & 1 qt. Sample                               | District            | Jackson   |
| 815      | Riprap and Slope Paving                  | Concrete Items                         | See Item No. 804   |                     |           |
|          |  | Geotextile                             | Manufacturer's Certification & 5 S.Y. Sample Each Lot, Each Shipment | District            | Jackson   |
|          |  | Cloth or Jute Bags                     | Approval   | District            | District  |
|          |  | Riprap                                 | Pretested or Visual Inspection; MDOT APL                             | Jackson or District |           |
|          |  | Sediment Control Stone                 | 75 lb. Initial Sample (Gradation) ; MDOT APL                         | District            | District  |
| 816      | Maintenance Painting of Metal Structures | Paint (Prime, Intermediate & Top Coat) | MDOT APL, Certification & 1 qt. Sample                               | District            | Jackson   |
| 820      | Timber Structures                        | Treated Timbers (Piling, Lumber)       | Pretested  | Jackson             | Jackson   |
|          |  | Hardware                               | Manufacturer's Certification   |                     |           |
| 822      | Neoprene Expansion Joints                | Joints                                 | Manufacturer's Certification   |                     |           |

**REFERENCED NOTES IN SCHEDULE FOR JOB CONTROL SAMPLING AND TESTING**

(1) Determination of Lot Sizes

**Annotations:**  
**Commission Order:** 121633

| <u>More than</u> | <u>To and Including</u>   |
|------------------|---|
| 0                | 500 cu. yds. per hour, a lot equals 6 hours production  |
| 501              | 600 cu. yds. per hour, a lot equals 5 hours production  |
| 601              | 750 cu. yds. per hour, a lot equals 4 hours production  |
| 751              | 1000 cu. yds. per hour, a lot equals 3 hours production   |
| 1001             | 1500 or more cu. yds. per hour, a lot equals 2 hours production                                 |
| 1501             | or more cu. yds. per hour, a lot equals 1 hour production                                       |
|                  | Maximum thickness of a lot tested cannot exceed 2 feet, regardless of volume of material placed |

- (2) All bituminous materials shall be shipped under Certificate "A" or "B" (Certification by refinery) and job control sampling shall be performed at the following rate:
- (A) Asphalt for Plant Mixes and Fabric Undersealing. One sample for each week during continuous production and one sample each 50,000 gallons received during period of intermittent operation. For projects with less than 250 tons of mix, see S.O.P. No. TMD-20-05-00-000.
  - (B) Asphalt for Surface Treatment. One sample for each 50,000 gallons or fraction thereof. For projects with less than 1000 gallons, see S.O.P. No. TMD-20-05-00-000.
  - (C) Asphalt for prime, curing, tack coat, joint sealing and crack filling. One sample for each 30,000 gallons or fraction thereof. For projects with less than 6000 gallons, see S.O.P. No. TMD-20-05-00-000.
- (3) Sampling Frequency. Contractor is to conduct those quality control (QC) tests as required at the following frequency for each mixture produced based on the estimated plant tonnage at the beginning of the day. District is to conduct those quality assurance (QA) tests at a minimum frequency of 10% of the QC tests.

| <u>TOTAL ESTIMATED PRODUCTION, tons</u> | <u>NUMBER OF TESTS</u> |
|---|------------------------|
| 50-800                                  | 1                      |
| 801-1700                                | 2                      |
| 1701-2700                               | 3                      |
| 2701+                                   | 4                      |

The above testing frequencies are for the estimated plant production for the day. If production is discontinued or interrupted, the tests will be conducted at the previously established sample tonnage points for the materials that are actually produced. If the production exceeds the estimated tonnage, sampling and testing will continue at the testing increments previously established for the day. A testing increment is defined as the estimated daily tonnage divided by the required number of tests from the table above.

In addition to the above program, the following tests shall be conducted on the first day of production and once for every eight production samples thereafter, with a minimum of one test per production week.

- Aggregate Stockpile Gradations  
(sample from cold feed bins or stockpile) (AASHTO T-11 and T-27)
- Reclaimed Asphalt Pavement (RAP) Gradation  
(sample from cold feed bin or stockpile) (Mississippi Test Method MT-31)

Fine Aggregate Angularity for all 9.5 mm mixtures and all MT and HT mixtures designed above the maximum density line. (ASTMC 1252 Method A)

At least one stripping test (MT-63) will be performed at the beginning of each job-mix production and thereafter, at least once every two weeks of production. If a stripping test fails, a new antistriper rate shall be established or other changes made immediately that will result in a mixture which conforms to the specifications; otherwise, production shall be suspended until corrections are made.

- (4) Densities shall be taken as required by specifications. Each lot will consist of each day's operation per layer placed, with a maximum lot length of 10,000 linear feet. The lot will be divided into five approximately equal sublots. One density test will be taken at random in each of the sublots. Average of the five (5) tests will be the lot density.
- (5) Job control acceptance sampling shall be performed as follows:
  - (A) Normally, one sample for each 500 cubic yards of concrete produced.
  - (B) A minimum of one sample for each half-day's operation.
- (6) Structure backfill is to be considered a separate frame of work. The backfill at each structure up to a depth of four feet will be considered a lot, except that for very long or very large structures, the Engineer may specify that the backfill be divided into more than one lot.
- (7) All pretested reinforcing steel should have the following, or similar wording on the Project Engineer's copy of the shipping invoice: "This material was shipped from MDOT Pretested Stock." If the steel has not been pretested, the following shall apply:
  - (A) Submit one (1) thirty (30) inch sample for each bar size for each ten (10) tons or fraction thereof to the Central Laboratory for testing. If the sample is cut with a torch, the sample length shall be forty-two (42) inches.
- (8) Types A, H, and I markers: Three (3) copies of manufacturer's certification PLUS 10 markers each type and class per lot.  
  
Types B – G markers: Three (3) copies of manufacturer's certification. Sample markers at the Engineer's discretion.
- (9) The Contractor shall furnish the manufacturer's certified test reports and certification covering each manufacturer's lot in a shipment. Dimensions are to be checked in the field prior to placement.  
  
Department representative from the District or Project Office will sample the bearing pads at the rate of one (1) plain pad per manufacturer's lot, and in the case of reinforced bearings one (1) pad per thickness per project. Samples obtained by the Department will be retained in the District or Project Office until final acceptance of the project. The pads will be tested as deemed necessary by the Department.
- (10) Each completed lift will be accepted with respect to compaction on a lot to lot basis from density tests performed by the Department. For normal production days, divide the production into approximately equal lots as shown in the following table. When cores are being used for the compaction evaluation, randomly obtain one core from each lot. When the nuclear density gauge is being used for compaction evaluation, obtain two random readings from each lot and average the results for the lot density (see Chapter 7 of the latest edition of MDOT's Field Manual for HMA). Additional tests may be required by the Engineer to determine acceptance of work appearing deficient. The Contractor shall furnish and maintain traffic control for all compaction evaluations required in satisfying specified density requirements.

**Lot Determination**

| Daily Production — Tons | Number of Lots |
|-------------------------|----------------|
| 0-300                   | 1              |
| 301-600                 | 2              |
| 601-1000                | 3              |
| 1001-1500               | 4              |
| 1501-2100               | 5              |
| 2101-2800               | 6              |
| 2801+                   | 7              |

(11) For information regarding the Structural Concrete Quality Control/Quality Assurance (QC/QA) Program see Section 804 of the Standard Specifications and Section 2.5 in the MITCM (See Note 13).

(12) Mill test reports (MTR) required on steel used in manufacture of bolts, nuts, washers and direct tension indicators. Manufacturer's certified test report (MCTR) required for each lot of bolts, nuts, washers, and direct tension indicators. Distributor certified test reports (DCTR) required on each lot of bolts, nuts, washers and direct tension indicators.

Job Control acceptance samples shall be obtained at the rate of one (1) sample per shipment per manufacturer's lot for each size bolts, nuts, washers and direct tension indicators. The size of each sample of these materials shall be as specified in Section 717.02.7 of the Standard Specifications.

(13) MITCM – *Materials Division Inspection, Testing, and Certification Manual*. The latest version can be found on the Materials Division intranet webpage at MDOT@Work or by contacting Materials Division.

**PART IV**

**SAMPLING AND TESTING OF SMALL  
QUANTITIES OF MISCELLANEOUS MATERIALS**

Approved by: Larry L. Brown

S.O.P. No.: **TMD-20-05-00-000** Mississippi Department of Transportation - Standard Operating Procedures

Subject: **SAMPLING AND TESTING OF SMALL QUANTITIES OF MISCELLANEOUS MATERIALS**

Effective Date: April 01, 2003  
 Issued Date: April 01, 2003

Supersedes S.O.P. TMD-20-05-00-000 Dated May 01, 1995

**PURPOSE:** To establish a standard procedure for sampling and testing small quantities of materials for contracts such as Topics, Safety, Control of Junk Yards, Rest Areas, Maintenance Repair, and other projects.

**1. GENERAL**

It is intended that the reduced sampling and testing procedures be permitted for small quantities of materials that will not adversely affect the traffic-carrying capacity of a completed facility. Such procedures will not be permitted for concrete in major structures or other structurally critical items.

**2. SAMPLING AND TESTING OF SMALL QUANTITIES OF MISCELLANEOUS MATERIALS**

2.1 Sampling and testing of small quantities of miscellaneous materials may be waived by the State on the basis of one of the two following methods:

2.1.1 Acceptance on the basis of visual examination provided the source has recently furnished similar material found to be satisfactory under the normal sampling and testing procedures of the Department.

2.1.2 Acceptance on the basis of certification by the producer or supplier that the material complies with the specification requirements.

2.2 Under either of these two methods, the primary documentation of acceptance (certificate from Project Engineer or certification from Producer) shall be provided by the Project Engineer with copies to the District Materials Engineer, State Materials Engineer, and State Construction Engineer. This documentation shall include the material and quantity covered by the acceptance.

2.3 The following are maximum quantities of material that may be accepted as set out in Sections 2.1.1 and 2.1.2:

- (1) Aggregate for Surface Treatment .....100 cu. yds.
- (2) Granular Material .....1,000 cu. yds.
- (3) Bituminous Mixtures..... 250 tons
- (4) Liquid Asphalt..... 6,000 gals.
- (5) Paint & Epoxy Systems..... 55 gals.
- (6) Lumber ..... Recognized commercial grades only to be used
- (7) Treated Lumber (not used in bridge superstructures) ..... 2 M Bd. Ft.
- (8) Masonry Items.....500 pieces
- (9) Pipe, Diameter Less than 30-inch diameter (Concrete and Metal)..... 100 L. F.
- (10) Grass Seed ..... Quantity for 3 acres
- (11) Agricultural Limestone..... 15 tons
- (12) Fence (all types).....500 L. F.
- (13) Fence Posts & Anchors..... Quantity for 500 L. F. of fence
- (14) Staples, Tie Wire, etc. .... Quantity for 500 L. F. of fence
- (15) Gates..... 2 each

Annotations:  
 Commission Order:

Approved by: Larry L. Brown

- (16) Reinforcing Steel..... 1,000 lbs.
- (17) Grates or Castings ..... 5 each
- (18) Nails ..... Recognized commercial grade to be used
- (19) Wire Mesh ..... 10 rolls
- (20) Portland Cement Concrete .....200 cu. yds.
- (21) Geotextile Fabric \*..... 2 rolls
- (22) Bituminous Adhesive..... 100 lbs.
- (23) Expansion Joint Material (Fiber) ..... 100 sq. ft.
- (24) Glass Beads..... 100 lbs.
- (25) Raised Pavement Markers..... 50 each type
- (26) Filter Material (A or B) .....100 cu. yds.
- (27) Cold Plastic Tape ..... 100 L. F.
- (28) Backer Rod ..... 120 L. F.
- (29) Dowel Assembly..... 10 units
- (30) Guardrail Wood Post..... 25 units
- (31) ROW Markers ..... 5 each
- (32) Poured Joint Sealant..... 20 gals.

\* Does not apply to any geotextile used under rip rap. These must be tested per TMD-20-04-00-000.

**NOTE:** Cement and aggregates for concrete items shall be from approved sources. Concrete shall be produced from a concrete batch plant which has a current plant calibration. The Project Engineer shall furnish plant inspection as deemed necessary for control. The producer shall furnish with each load of concrete a delivery ticket containing the following information:

- (1) Project Number
- (2) Class Concrete
- (4) Weight of Cement
- (3) Free Water in Aggregate (gallons)
- (5) Weight of Fine Aggregate
- (6) Weight of Coarse Aggregate
- (7) Water in Mix (gallons)
- (8) Number of Revolutions Mixed
- (9) Time of Batching

An occasional test cylinder, slump test, and air content, when specified, shall be performed and no less than one (1) shall be performed for each project.

**PART V**  
**SAMPLING AND LOT SIZES**

Approved by: Larry L. Brown

S.O.P. No.: **TMD-20-03-00-000** Mississippi Department of Transportation - Standard Operating Procedures

Subject: **SCHEDULE OF STANDARD LOT SIZES FOR CONFORMITY DETERMINATION**

Effective Date: **August 01, 2005**  
 Issued Date: **September 01, 2003**

Supersedes S.O.P. **TMD-20-03-00-000** Dated **May 01, 1995**

**PURPOSE:** To establish a schedule of lot sizes to be used in the determination of conformity with the specifications for various operations.

1. Deviation from the standard lot sizes shown may be made by the Engineer under the conditions set forth in the Contract Specifications.
2. The Standard Lot Size is to be followed within reasonable limits when the daily production is near normal or average for that particular type construction. When the daily production is extremely high or extremely low, then the Standard Lot Size may be varied with the judgment and consent of the District Materials Engineer. In cases where pay quantity is subject to adjustment as provided for in Contract Specifications, the Standard Lot Size will be followed as closely as possible.

**SCHEDULE OF STANDARD LOT SIZES FOR CONFORMITY DETERMINATION**

| <u><b>TYPE OF CONSTRUCTION</b></u>           | <u><b>OPERATION</b></u> | <u><b>STANDARD LOT SIZE</b></u>     |
|--|-------------------------|-------------------------------------|
| Embankments:                                 |                         |                                     |
| Basement Soils                               | Density                 | Note (1)                            |
| Design Soils                                 | Density                 | Note (1)                            |
| Structure Backfill                           | Density                 | Each 4-ft. depth, Note (3)          |
| Granular Courses                             | Density                 | 2500 L. F. (each layer)             |
| In-Grade Modification                        | Density                 | 2500 L. F.                          |
| Lime-Treated Courses<br>(Classes A, B, C)    | Density                 | 2500 L. F. (each layer)<br>Note (2) |
| Portland Cement-Treated Courses              | Density                 | 2500 L. F. (each layer)<br>Note (2) |
| Mechanically Stabilized Courses              | Density                 | 2500 L. F. (each layer)             |
| Lime-Fly Ash Treated Courses                 | Density                 | 2500 L. F. (each layer)<br>Note (2) |
| Shoulders (all types)                        | Density                 | Day's Production (10,000 L.F. max.) |
| Hot Mix Asphalt                              | Density                 | Note (4)                            |
| Hot Mix Asphalt                              | Laboratory Testing      | Note (5)                            |
| In-Grade Modification                        | Width                   | 1,000 L. F.                         |
| Lime-Fly Ash Treated Courses                 | Width                   | 1,000 L. F. (each layer)            |
| Portland Cement Treated Courses              | Width                   | 1,000 L. F. (each layer)            |
| Mechanically Stabilized Courses              | Width                   | 1,000 L. F. (each layer)            |
| In-Grade Preparation - Top of Design<br>Soil | Density                 | 1,000 L. F.                         |

**Annotations:**  
**Commission Order:**

Approved by: Larry L. Brown

**Note (1) Determination of Lot Sizes**

| <u>More Than</u> | <u>To and Including</u>                                   |
|------------------|---|
| 0                | 250 cu yds. per hour, a lot equals 6 hrs. production      |
| 251              | 500 cu. yds. per hour, a lot equals 5 hrs. production     |
| 501              | 750 cu. yds. per hour, a lot equals 4 hrs. production     |
| 751              | 1,000 cu. yds. per hour, a lot equals 3 hrs. production   |
| 1,001            | or more cu. yds. per hour, a lot equals 2 hrs. production |

**Note (2)** At the discretion of the Project Engineer, a residual portion of a lot completed during a day's operation may be considered as a separate lot or may be included in the previous or the subsequent lot, except that any day's operation of less than one full lot shall be considered a lot.

**Note (3)** Structure backfill is to be considered a separate frame of work. The backfill at each structure up to a depth of four feet will be considered a lot. For long structures, the Engineer may specify that the backfill be divided into smaller lots.

**Note (4)** Each completed lift will be accepted with respect to compaction on a lot to lot basis. For normal production days, divide the production into approximately equal lots as shown in the following table. Obtain two random readings with the nuclear density gauge from each lot and average the results (see Chapter 7 of the latest edition of MDOT's Field Manual for HMA). Additional tests may be required by the Engineer to determine acceptance of work appearing deficient.

**Lot Determination**

| Daily Production — Tons | Number of Lots |
|-------------------------|----------------|
| 0-300                   | 1              |
| 301-600                 | 2              |
| 601-1000                | 3              |
| 1001-1500               | 4              |
| 1501-2100               | 5              |
| 2101-2800               | 6              |
| 2801+                   | 7              |

**Note (5)** Quality Assurance (QA) testing shall be at a minimum frequency of 10% of the Contractor's Quality Control (QC) testing. Refer to 907-401 specifications and Chapters 5 and 6 of the latest edition of MDOT's Field Manual for HMA to determine lot sizes and required tests.

## JOB CONTROL SAMPLING AND TESTING CHART

| JOB CONTROL SAMPLING & TESTING          | SAMPLED by District | TESTED by District | TESTED by Jackson |                   |
|---|---------------------|--------------------|-------------------|-------------------|
| Reference S.O.P. TMD-20-04-00-000       |                     |                    |                   |                   |
| **Aggregates                            | X                   | X                  | X                 |                   |
| Agricultural Limestone                  | X                   |                    | X                 |                   |
| Bearing Pads                            | X                   | X                  |                   | Field Measured    |
| Bituminous Materials                    | X                   |                    | X                 |                   |
| Borrow Material                         | X                   | X                  |                   |                   |
| Brick                                   | X                   |                    | X                 |                   |
| Calcium Chloride                        | X                   |                    | X                 |                   |
| *Cement & Fly Ash                       | X                   |                    | X                 |                   |
| *Chain Link Fencing (Wire & Metal Post) | X                   |                    | X                 |                   |
| Cold Mix, if not Pretested              | X                   |                    | X                 |                   |
| Concrete                                | X                   | X                  | X                 |                   |
| Densities                               |                     | X                  |                   |                   |
| Dowel Assemblies & Dowels               | X                   |                    | X                 |                   |
| *Geotextiles                            | X                   |                    | X                 | As Applicable     |
| *Gates (Aluminum Slated or Galvanized)  | X                   | X                  |                   | Field Measured    |
| **Granular Material                     | X                   | X                  | X                 |                   |
| Lime                                    | X                   |                    | X                 |                   |
| Reinforcing Steel, if not Pretested     | X                   |                    | X                 |                   |
| Seed                                    | X                   |                    |                   | MSU Lab – Tested  |
| Sod                                     |                     | X                  |                   | Visual Inspection |
| Topsoil                                 | X                   | X                  |                   |                   |
| Vegetative Material for Mulch           |                     | X                  |                   | Visual Inspection |
| Water                                   | X                   |                    | X                 |                   |
| Wire, Barbed, Tension Tie & Woven       | X                   |                    | X                 |                   |
| *Wire Rope or Cable and Spiral Wire     | X                   |                    | X                 |                   |
| Wire Mesh, if not Pretested             | X                   |                    | X                 |                   |

\* See List of Materials Requiring Certification

\*\* Jackson – Source Sample

**PRETESTED MATERIALS CHART**

| PRETESTED MATERIALS                   | MDOT STAMP | CERTIFICATE | MDOT METAL SEAL | STATEMENT PRETESTED STOCK | APPROVED SOURCE | MFGR'S ID # ON UNIT W/FORM 895 | MFGR'S ID # W/TEST REORTS ON DELIVERY |
|---------------------------------------|------------|-------------|-----------------|---------------------------|-----------------|--------------------------------|---------------------------------------|
| Reference S.O.P. TMD-20-0400-000      |            |             |                 |                           |                 |                                |                                       |
| Asphalt Cement                        |            | X           |                 | X                         | X               |                                |                                       |
| Bituminous Plastic Sealer             | X          |             |                 |                           |                 |                                |                                       |
| Castings and Gratings                 |            |             | X               |                           |                 |                                |                                       |
| Cold Mix from AL (Truck)              |            |             |                 | X                         |                 |                                |                                       |
| Cold Mix from AL (Rail)               |            |             |                 | X                         |                 |                                |                                       |
| Concrete Beams                        |            |             |                 |                           |                 | X                              |                                       |
| Concrete Piling                       |            |             |                 |                           |                 | X                              |                                       |
| Concrete Pipe, Precast Intets & Boxes | X          |             |                 | X                         |                 |                                |                                       |
| Concrete Posts                        | X          |             |                 | X                         |                 |                                |                                       |
| Concrete ROW Markers                  | X          |             |                 | X                         |                 |                                |                                       |
| Expansion Joint Material              | X          |             |                 | X                         |                 |                                |                                       |
| Glass Beads*                          | X          |             |                 | X                         |                 |                                |                                       |
| Liquid Membrane                       | X          |             |                 |                           |                 |                                |                                       |
| Metal Pipe Uncoated                   |            |             | X               |                           |                 |                                |                                       |
| Metal Pipe Coated                     |            |             | X               |                           |                 |                                |                                       |
| Paint                                 | X          |             |                 | X                         |                 |                                | X                                     |
| Precast Concrete Units                | X          |             |                 |                           |                 |                                | X                                     |
| Pavement Markers & Adhesives          | X          |             |                 | X                         | X               |                                |                                       |
| Rip Rap                               |            |             |                 | X                         | X               |                                |                                       |
| Reinforcing Steel                     |            |             |                 | X                         |                 |                                |                                       |
| Roadway Angles                        |            |             | X               |                           |                 |                                |                                       |
| Treated Wood Products                 | X          |             |                 | X                         |                 |                                |                                       |
| Wire Mesh                             |            |             | X               | X                         |                 |                                |                                       |

\*Pretested Glass Beads without a MDOT Inspectors Stamp must have an MDOT Issued Test Report for each lot of beads received. If the shipment does not have a MDOT test report, the lot must be sampled.

**SAMPLE CONTAINER CHART**

| Material                         | Cloth Sample Bag | One Quart Metal Can | One Gallon Plastic Jug | One Gallon Moisture Tight Container | 1 1/2 Pint Plastic Jar | Manila Envelope | One Gallon Triple Seal Can |
|----------------------------------|------------------|---------------------|------------------------|-------------------------------------|------------------------|-----------------|----------------------------|
| Aggregates                       | X                |                     |                        |                                     |                        |                 |                            |
| Agricultural Limestone           |                  |                     | X                      |                                     |                        |                 |                            |
| Bituminous Materials             |                  |                     |                        |                                     |                        |                 |                            |
| AC                               |                  | X                   |                        |                                     |                        |                 |                            |
| Cutbacks                         |                  |                     | X                      |                                     |                        |                 |                            |
| Emulsions                        |                  |                     | X                      |                                     |                        |                 |                            |
| Calcium Chloride                 |                  | X                   |                        |                                     |                        |                 |                            |
| Cement & Fly Ash                 |                  |                     |                        |                                     |                        |                 | X                          |
| Granular Materials               | X                |                     |                        |                                     |                        |                 |                            |
| Hot Bituminous Mixes (Antistrip) |                  |                     |                        | X                                   |                        |                 |                            |
| Hydrated Lime*                   |                  |                     |                        | X                                   |                        |                 |                            |
| Seed (Roadside Development)      |                  |                     |                        |                                     |                        | X               |                            |
| Water                            |                  |                     |                        |                                     | X                      |                 |                            |

\*Fill Half Full

**PART VI**  
**MATERIAL CERTIFICATION**

**Mississippi Standard Specification for Road and Bridge Construction  
Section 700.05, Material Certifications and Certified Test Reports**

**700.05—Material Certifications and Certified Test Reports.** All certifications and certified test reports shall meet the requirements set forth herein except certification requirements for cement and asphalt are set out separately in Department SOP TMD-21-01-00-000 and TMD-22-01-00-000 (Refer to MITCM Sections 2.2 and 2.1, respectively now).

700.05.1—Certifications. All certifications shall:

- (a) Have letterhead of the manufacturer, producer, supplier, or fabricator.
- (b) Include the project number.
- (c) Itemized list of materials covered by the certification.
- (d) Contain a material conformance statement which certifies that the materials conform to the specific specification requirements. Example:  
I/We hereby certify the materials listed herein conform to the requirements of Subsection 714.14 of the Mississippi Standard Specifications for Road and Bridge Construction.
- (e) Certification for all iron, steel and steel wire products must also include a certified statement by the manufacturer that all of the manufacturing processes, excluding those for pig iron and processed, pelletized, and reduced iron ore used in the manufacture of said steel and/or iron products, have occurred domestically.
- (f) Signature of a responsible company official.

700.05.2--Certified Test Reports. All certified test reports shall:

- (a) Have letterhead of the manufacturer, producer, supplier, fabricator, or laboratory.
- (b) Include name and description of material, lot, batch or heat number, etc., as applicable.
- (c) Show results of each required test, and state that the test was run according to the test method specified.
- (d) Test reports for all iron, steel and steel wire products must also include a certified statement by the manufacturer that all of the manufacturing processes, excluding those for pig iron and processed, pelletized, and reduced iron ore used in the manufacture of said steel and/or iron products, have occurred domestically.
- (e) Signature of the responsible laboratory official.

MDOT INSPECTORS HANDBOOK

| MATERIALS<br>REQUIRING<br>CERTIFICATION      | Referenced Specification | Job Control Sampling | Approved List | Certified: | Manufacturer's | Fabricator's | Mill Test Report | Refinery Test Reports | Test Reports | Certification of Compliance | Certificate "A" | Certificate "B" | Domestic Products | Warranties | Guaranties | Guaranteed Analysis | Nursery Inspector Report | Plant Quarantine | Label/Tag | Instruction Sheets | Parts List |  |
|--|--------------------------|----------------------|---------------|------------|----------------|--------------|------------------|-----------------------|--------------|-----------------------------|-----------------|-----------------|-------------------|------------|------------|---------------------|--------------------------|------------------|-----------|--------------------|------------|--|
|  |                          |                      |               |            |                |              |                  |                       |              |                             |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Admixtures, Concrete                         | 713.02                   |                      | X             | X          | X              |              |                  |                       | X            |                             |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Asphalts, Liquid                             | 702                      | X                    | X             | X          | X              |              |                  | X                     | X            | X                           | X               |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Backer Rod                                   | 707.02                   | X                    |               | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Bearing Pad                                  | 714.10                   | X                    |               | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Cement, Hydraulic                            | 701                      | X                    | X             | X          | X              |              | X                |                       | X            | X                           | X               |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Ditch Liners & Staples                       | 715.09                   |                      |               | X          | X              |              |                  |                       | X            |                             |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Electrical/Mechanical Items                  | 722                      |                      |               | X          |                |              |                  |                       |              |                             |                 |                 |                   | X          | X          |                     |                          |                  |           |                    |            |  |
| Epoxy Mastic System                          | 710.04                   |                      |               | X          | X              |              |                  |                       |              |                             |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Fence-Chain Link, Complete                   | 712.04                   | X                    |               | X          |                | X            |                  |                       | X            | X                           |                 |                 | X                 |            |            |                     |                          |                  |           |                    |            |  |
| Fertilizer(Combination or Manufactures)      | 715.02                   |                      |               |            |                |              |                  |                       |              |                             |                 |                 |                   |            |            | X                   |                          |                  | X         |                    |            |  |
| Geotextiles                                  | 714.13                   | X                    |               | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Fly Ash                                      | 714.05                   | X                    | X             | X          | X              |              | X                |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Gasket, Flexible                             | 707.04 & 06              |                      |               | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Gate   | 712.12                   |                      |               | X          | X              |              |                  |                       |              |                             |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Guard Rail/All Metal Component               | 712                      |                      | X             | X          |                | X            | X                |                       |              |                             |                 |                 | X                 |            |            |                     |                          |                  |           |                    |            |  |
| Illumination & Signals Material              | 722                      |                      | X             | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   | X          |            |                     |                          |                  |           | X                  | X          |  |
| Joint Material—Elastomeric                   | 707                      |                      |               | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Masonry Blocks                               | 706.3                    |                      |               | X          | X              |              |                  |                       |              |                             |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Miscellaneous Metals                         | 716                      |                      |               |            |                |              | X                |                       | X            |                             |                 |                 | X                 |            |            |                     |                          |                  |           |                    |            |  |
| Mulch, Tree Bark                             | 715.07                   |                      |               |            |                |              |                  |                       |              |                             |                 |                 |                   |            |            | X                   |                          |                  | X         |                    |            |  |
| Pavement Marking Materials:                  |                          |                      |               |            |                |              |                  |                       |              |                             |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Thermoplastic                                | 720.02                   |                      |               | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| *Glass Beads                                 | 720.04                   |                      |               | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| *Bituminous Adhesive                         | 720.03                   | X                    | X             | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| *Raised Pavement Markers                     | 720.03                   | X                    | X             | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Tape, Marking                                | 720.05 & 06              |                      | X             | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Cold Plastic Pavement Markings               | 720.04                   | X                    | X             | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Plastic Horizontal Drains & Outlets          | 708.18                   |                      |               | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Polyethylene Sheeting                        | 713.01                   |                      |               | X          | X              |              |                  |                       | X            |                             |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Rapid Set Grout, Patching, & Anchor Material | 714.11                   |                      | X             | X          | X              |              |                  |                       | X            |                             |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |

MDOT INSPECTORS HANDBOOK

| MATERIALS<br>REQUIRING<br>CERTIFICATION     | Referenced Specification | Job Control Sampling | Approved List | Certified: | Manufacturer's | Fabricator's | Mill Test Report | Refinery Test Reports | Test Reports | Certification of Compliance | Certificate "A" | Certificate "B" | Domestic Products | Warranties | Guaranties | Guaranteed Analysis | Nursery Inspector Report | Plant Quarantine | Label/Tag | Instruction Sheets | Parts List |  |
|---|--------------------------|----------------------|---------------|------------|----------------|--------------|------------------|-----------------------|--------------|-----------------------------|-----------------|-----------------|-------------------|------------|------------|---------------------|--------------------------|------------------|-----------|--------------------|------------|--|
|   |                          |                      |               |            |                |              |                  |                       |              |                             |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Seed  | 715.03                   | X                    |               |            |                |              |                  |                       | X            |                             |                 |                 |                   |            |            | X                   |                          |                  | X         |                    |            |  |
| Signing Materials (Steel)                   | 721                      |                      |               | X          | X              |              |                  |                       |              | X                           |                 |                 | X                 |            |            |                     |                          |                  |           |                    |            |  |
| Sprayed Finish, Concrete                    | 714.12                   |                      | X             | X          | X              |              |                  |                       | X            | X                           |                 |                 |                   |            |            |                     |                          |                  |           |                    |            |  |
| Steel Grid Flooring                         | 717.05                   |                      |               | X          | X              |              | X                |                       | X            | X                           |                 |                 | X                 |            |            |                     |                          |                  |           |                    |            |  |
| Structural Bolts, Nuts,<br>Washers, & DTI's | 717.02.<br>2.4           | X                    |               | X          | X              |              | X                |                       | X            |                             |                 |                 | X                 |            |            |                     |                          |                  |           |                    |            |  |
| Structural Plate                            | 709.14                   |                      | X             | X          |                | X            | X                |                       |              | X                           |                 |                 | X                 |            |            |                     |                          |                  |           |                    |            |  |
| Structural Steel                            | 717.01                   |                      |               | X          | X              |              | X                |                       |              |                             |                 |                 | X                 |            |            |                     |                          |                  |           |                    |            |  |
| Trees, Shrubs, and Tree<br>Seedling         | 230.02/<br>231.02        |                      |               | X          |                |              |                  |                       |              |                             |                 |                 |                   |            |            |                     | X                        | X                | X         |                    |            |  |
| Welded Stud Shear<br>Connectors             | 717.04                   |                      |               | X          | X              |              |                  |                       | X            | X                           |                 |                 | X                 |            |            |                     |                          |                  |           |                    |            |  |

\*If not Pre-tested

**APPENDIX A**

**MATERIALS OPERATING PROCEDURES**

## **PART VII: Appendix A, Materials Operating Procedures**

### **Index of Materials Operating Procedures**

- A-1** MTICM\* SECTION 4.1.3, Acceptance of Materials Used in Certain Maintenance Projects by Certification of the Project Engineer
- A-2** MITCM SECTION 3.1—Hot Mix Asphalt Mix Design Approval Process
- A-3** MTICM SECTION 3.2—Portland Cement Concrete Mix Design Approval Process
- A-4** MTICM SECTION 1.3.4—MDOT Concrete Technician Certification Program
- A-5** MITCM SECTION 2.5
  - a. Identification of Prestress or Precast Concrete Bridge Members
  - b. Inspection of Prestressed Concrete Bridge Members at the Bridge Construction Site
- A-6** MTICM Section 2.10—Seed for Roadside Development
- A-7** Sample Information Card (Form TMD-320) to Accompany Job Control Samples
- A-8** SiteManager Quick Reference Guide

\* MTICM is the Materials Division Inspection, Testing, and Certification Manual

### **4.1.3 Acceptance of Materials Used in Certain Maintenance Projects by Certification of the Project Engineer**

**4.1.3.1 General** – To establish a procedure whereby materials used in the construction of project offices, maintenance buildings, shops, and additions and alterations to existing buildings (including District buildings) may be accepted by certification.

#### **4.1.3.2 Acceptance of Materials by Certification**

- (1)** The normal procedures for acceptance of the materials used in the construction of the facilities as set out above may be waived and the materials accepted on the basis of a Letter of Certification stating all materials installed (structural, mechanical, electrical, plumbing, miscellaneous, etc.) had been approved by the Architectural Services Division and met the requirements of the specifications, plans, and shop drawings. The Letter of Certification shall be provided by the Project Engineer with copies to the District Materials Engineer and the State Materials Engineer.
- (2)** Upon receipt of this certification, the State Materials Engineer will issue the Letter of Certification of Materials and Tests (Form TMD 442) to the State Construction Engineer.
- (3)** Concrete aggregates, stabilizer aggregates, cementitious materials, water, and steel reinforcement are subject to normal job control sampling and record sampling testing procedures. However, where applicable, these materials may be accepted under the provisions of S.O.P. No. TMD-20-05-00-000, Sampling and Testing of Small Quantities of Miscellaneous Materials.

### 3.1 Hot Mix Asphalt Mix Design Approval Process

**3.1.1 Hot Mix Asphalt Mix Design Approvals** – All requests for a new hot mix asphalt mix design must be submitted to the State Materials Engineer in writing for review. Requests will be forwarded to the Lab Operations Branch.

After an initial review, the mix parameters will be checked for compliance against the project specifications using the Departments mix design spreadsheet. Once the design parameters have been verified, the mix will be tested in the lab in accordance with MT-78 Volumetric Mix Design of Hot Mix Asphalt Mixtures Using the Superpave Gyratory Compactor.

Upon completion of the laboratory testing, the mix design parameters will be entered into a sample record within SiteManager and a copy of the approved mix design sent to the District Materials Engineer that submitted the mix design request.

**3.1.2 Hot Mix Asphalt Mix Design Transfers** – All requests to transfer a hot mix asphalt design from one project to another must be submitted to the State Materials Engineer in writing for review. Requests will be forwarded to the Lab Operations Branch.

Upon review of the request, a sample record will be entered into SiteManager and the sample record will be linked to the original test data using the “Link To” functionality within SiteManager.

**3.1.3 Termination of a Hot Mix Asphalt Mix Design** – In the event a hot mix asphalt mix design does not perform satisfactorily in the field in accordance with the project specifications, the District Materials Engineer may submit a request to terminate a mix design to the State Materials Engineer for review. If upon review, a mix design is deemed deficient due to field performance, a termination date will be entered into SiteManager and the mix design will not longer be valid.

## 3.2 Portland Cement Concrete Mix Design Approval Process

**3.2.1 Portland Cement Concrete Mix Design Approvals** – All requests Portland cement concrete mix designs must be submitted to the State Materials Engineer in writing for review. Requests will be forwarded to the Lab Operations Branch.

The mix design parameters will be checked for compliance against the project specifications using the Departments PCC Mix Design Spreadsheet. Once the design parameters have been verified, the mix will be given tentative approval pending field verification. The field verification process validated the producer/supplier's ability to supply the mix within the specified batching and field performance tolerances. Once the field verification of the mix is reviewed and approved by Materials Division, the mix will be given final approval.

Upon completion of the mix design review, the Laboratory Operations Branch will complete a sample record within SiteManager and attach the PCC Mix Design Spreadsheet.

**3.2.2 Portland Cement Concrete Mix Design Transfers** – A Portland cement concrete mix design that has undergone field verification and has final approval may be, upon written request to the State Materials Engineer, transferred to other projects. The District Materials Engineer is to certify that all of the component materials have not changed since the mix design received final approval.

**3.2.2 Termination of a Portland Cement Concrete Mix Design** – In the event Portland cement concrete mix design does not perform satisfactorily in the field in accordance with the project specifications, the Project Engineer or District Materials Engineer may submit a request to terminate a mix design to the State Materials Engineer for review. If upon review, a mix design is deemed deficient due to field performance, a termination date will be entered into SiteManager and the mix design will not longer be valid.

### 1.3.4 MDOT Concrete Technician Certification Program

#### 1.3.4.1 Scope

The MDOT QC/QA Concrete Technician Certification Program is intended to help assure appropriate minimum training and proficiency qualifications for all personnel, both agency and industry, who are involved with quality control (QC), quality assurance (QA), mix design, and testing concrete and aggregates for acceptance purposes on MDOT projects. There are three (3) classes of certification, as detailed below, and the appropriate class is required of each individual performing these duties on MDOT projects. Certifications are valid for five (5) years. Retesting is required for certification renewal.

#### 1.3.4.2 Program Administration

The Concrete Technician Certification Program shall be administered by the Mississippi Concrete Industries Association (MCIA). An Oversight Committee is established, consisting of the MCIA Technical Education Committee members, and MDOT's Assistant Chief Engineer of Operations, State Materials Engineer, and Assistant State Materials Engineer. The MDOT/MCIA Oversight Committee will meet once a year to approve any changes in the certification procedures.

#### 1.3.4.3 Certification Standards

(1) **CLASS 1** certification covers field testing fresh concrete. The Class 1 certification program consists of the nationally recognized ACI Concrete Field Testing Technician Grade 1 program, and any holder of a current certificate with this designation is thus Class 1 certified. No substitutions are accepted. The Class 1 program includes the following test procedures:

- a. Sampling (ASTM C 172)
- b. Slump (ASTM C 143)
- c. Unit Weight (ASTM C 138)
- d. Air Content - Volumetric Method (ASTM C 173)
- e. Air Content - Pressure Method (ASTM C 231)
- f. Molding Cylinders (ASTM C 31)
- g. Temperature - Concrete and Air (ASTM C 1064)

(2) **CLASS 2** certification is intended for MDOT QA technicians who perform certain field tests on aggregates as well as fresh concrete, and Contractor QC technicians who also sample aggregates and conduct these tests. The Class 2 certification program requires that the candidate have a valid Class 1 certification, and requires competency in the following field test procedures for aggregates:

- a. Sampling (AASHTO T 2)
- b. Reducing Field Samples to Testing Size (AASHTO T 248)
- c. Sieve Analysis of Fine and Coarse Aggregates (AASHTO T 27) and fineness modulus
- d. Total Moisture Content by Drying (AASHTO T 255) and moisture adjustment
- e. Adjustment of Batch Weights for Aggregate Moisture
- f. Concrete Fundamentals (PCA Design and Control of Concrete Mixtures)

(3) **CLASS 3** certified technicians are qualified to conduct certain field or laboratory tests on aggregates or concrete, and to design and make field adjustments to concrete mixes. The Class 3 certification program requires that the candidate have valid Class 1 and Class 2 certifications, and knowledge of the following procedures and specifications:

- a. Specific Gravity & Absorption of Coarse Aggregates (AASHTO T 85)
- b. Specific Gravity & Absorption of Fine Aggregates (AASHTO T 84)
- c. Unit Weight & Voids in Aggregates (AASHTO T 19)
- d. Making and Curing Concrete Test Specimens in the Lab (AASHTO T 126)
- e. Compressive Strength of Cylindrical Concrete Specimens (AASHTO T 22), including use of unbonded caps
- f. Capping Cylindrical Concrete Specimens (AASHTO T 231)
- g. Standard Specifications for Ready Mix Concrete (AASHTO M 157)
- h. Principles of mix design by PCA methods and MDOT special requirements
- i. Use of Admixtures
- j. Cementitious Materials
- k. MDOT Specifications 2004 Edition:
  - 631 Flowable Fill
  - 803.02.3 Drilled Shafts
  - 804 Concrete for Bridges and Structures
- l. Data Management procedures of MDOT's QC/QA Concrete Program

#### **1.3.4.4 Certification Process**

Each class of certification requires, and is contingent upon, current certification at the preceding class level. Certain concrete laboratory technician certifications granted through nationally recognized programs that test candidates in the same areas may be approved by MDOT, at the discretion of the State Materials Engineer, to substitute for Class 2 and/or Class 3 certifications. Each certification is valid for five (5) years. Renewal requires reexamination. ACI Grade 1 certification requires passing a closed-book written examination covering each of the referenced standards, and passing the performance examination (field testing) by properly demonstrating each ASTM test method. MDOT Class 2 and 3 certifications require passing an open-book written examination covering referenced AASHTO standards and concrete technology material presented in the course.

#### **1.3.4.5 Recertification**

Concrete technician recertification will be the same as the certification process, except that attending the classroom sessions will not be mandatory. When a technician's certification has expired after a five (5) year period, and the technician is enrolled in a recertification class, their certification is automatically extended for an additional 45 days until the results of their recertification test are known.

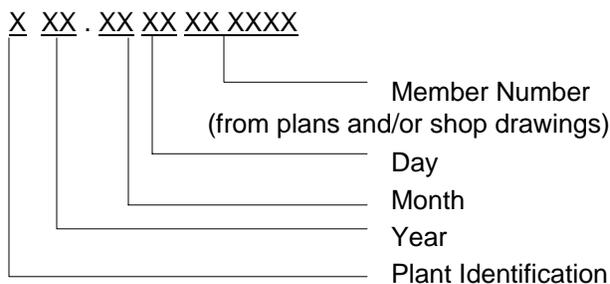
**2.5 Prefabricated Concrete Products**

**2.5.1 Identification of Prestressed or Precast Concrete Bridge Members** – The following section establishes a uniform numbering system for identification of pre-fabricated concrete bridge members and to indicate the location of the member in the structure.

**2.5.1.1 Responsibility of the Department**

**2.5.1.1.1 Identification Numbering System** – The Department shall assign a number to each member described as follows:

**(1) Identification Number Format:**



**(2) Plant Identification** – The plant identification shall be a one character letter. Plant letters shall be assigned by the District or Central Laboratory. The Central Laboratory shall approve and maintain a list of approved plant identification letters.

**(3) Year, Month, Day**

Example: 01.0512

01 is the year 2001  
 . is to break up the complexity of the number  
 05 is the month  
 12 is the day of the month  
 The date the member was cast is May 12, 2001.

**(4) Member Number** – The number assigned to each prestress or precast member represented on the plans and/or shop drawings.

**2.5.1.1.2 Member Length** – The length of the member shall be inscribed directly under the

**2.5.3 Inspection of Prestressed Concrete Bridge Members at the Bridge Construction Site**

– The following section establishes uniform procedures for the inspection of prestressed concrete bridge members at the bridge construction site.

**2.5.3.1 General** – An inspection will be performed on each prestressed concrete bridge member. A representative of the Project Office will perform the inspection.

**2.5.3.2 Documentation** – A completed copy of Form TMD-895 shall accompany the prestressed member when delivered to the bridge construction site, as required by the contract specifications. Refer to Appendix A for a copy of Form TMD-895. This form shall be reviewed upon arrival to the site by a representative of the Project Office.

**2.5.3.3 Inspection** – Upon arrival at the bridge construction site, the prestressed member shall be visually inspected by a representative of the Project Office for the following:

- (1) **Cracks** – Any cracks that may have occurred during transit, mainly near the middle of the member.
- (2) **Broken Corners** – Check for broken corners, on each end, at top and bottom of member that may have occurred during loading and unloading of the member.
- (3) **Identification Numbers** – The identification number should correspond to plans and/or shop drawings, as stated in Section 2.5.1 of this manual.
- (4) **Embedded Items** – Check for damage to inserts. Check for reinforcing steel extended from top and/or end of member. Check for damage to bearing plates.
- (5) **Coating of Strands** – Check for damage to the coating of the strands at beam ends.

**2.5.3.4 Acceptance and Rejection Procedures** – Following are guidelines for acceptance or rejection of a prestressed member upon inspection at the bridge site.

- (1) Prestressed members that have proper documentation and that pass visual inspection requirements may be incorporated into the work.
- (2) Members arriving at the bridge construction site without the proper documentation shall

- be rejected and not incorporated into the work until the Engineer receives the documentation.
- (3) Members with a visual crack across the width or depth are to be rejected.
  - (4) Members with broken corners with exposed reinforcing steel shall be repaired at the expense of the Producer.
  - (5) The Engineer may approve repairs of a prestressed member with damage to embedded items, made at the expense of the Producer.
  - (6) Damaged prestressed members that cannot be repaired to the satisfaction of the Engineer will be rejected and not used on Department projects.

**2.5.3.5 Reporting** – The following procedures shall be followed to document that Prestressed Concrete Bridge Members at the Bridge Construction Site were sampled and tested in accordance with project specifications and the procedures set forth in these provisions.

For member acceptance at the bridge construction site, the Project Office will enter the applicable information into a SiteManager Sample Record and complete the appropriate template for Project Engineer certification (CPE901 – Engineer Certification).

2.5.3.6 County or LPA Project Engineers shall retain copies of all applicable certificates for project clearance records.

## 2.10 Seeding: Seed for Roadside Development

The following section outlines the standard procedure for acceptance of seed.

**2.10.1 General** – Seed will be sampled and tested for acceptance by the Mississippi Department of Agriculture and Commerce Seed Laboratory at:

The Mississippi State University Seed Laboratory  
P.O. Drawer S  
Mississippi State, MS 39762

Test reports shall be issued prior to planting. Bags of seed not properly labeled or tagged will not be permitted. In addition, seed damaged in storage or from handling will not be permitted.

When more than nine (9) months have elapsed between the germination test data and the time of planting, exclusive of the calendar month in which the test was completed, the seed will be resampled and retested by the Mississippi Department of Transportation.

### 2.10.2 Seed Initially Sampled and Tested by the Mississippi Department of Agriculture and Commerce or other Laboratories

- (1) The Project Engineer shall check the certified label/tag of the seed to see that it meets the requirements of the specifications (Mississippi Standard Specifications for Road and Bridge Construction Section 715.03) and the state seed law prior to granting permission for planting.
- (2) Seed labeled with a total germination of less than 60 percent shall not be used. However, if the label indicates a deficiency in the germination or purity, the Project Engineer may approve increasing the application of seed to address the deficiency at no additional cost to the Department.
- (3) The Project Engineer will indicate acceptance or rejection of the seed and retain at least one (1) label/tag for each lot of seed used on the project.
- (4) The Project Engineer shall sample the seeds in accordance with MDOT

specifications and as noted below.

### **2.10.3 Seed Sampled and Tested by the Mississippi Department of Transportation**

#### **2.10.3.1 Sampling Apparatus**

- (1) The sampling apparatus for sampling Bahiagrass, Fescue, and similar or larger size seed shall be either of the following samplers:
  - a. 39-inch trier, double tube, 7/8-inch outside diameter, or
  - b. Fertilizer probe, 24 inches long, 3/4 -inch diameter, single tube
- (2) An 18-inch trier, 1/2 -inch outside diameter, double tube, shall be used for sampling Bermuda grass, Lespedeza, Clovers, Carpet grass, and similar or smaller size seed.

**2.10.3.2 Sample Containers**—Seed Samples shall be stored and shipped to the State Seed Testing Laboratory in TMD-088 (Container for Seed Samples).

**2.10.3.3 Lot Size**—a lot is defined as all the seed of each species (kind and variety) from the same source and with the same lot identification as shown on the tag of each bag of seed in approved storage at the time of sampling. Each subsequent shipment of each species of seed from the same or a different source will constitute a new lot.

#### **2.10.3.4 Sampling Procedure**

- (1) All seed sampling shall be performed by the appropriate District Laboratory. Each District Laboratory shall have at least two (2) properly trained employees to perform all seed sampling in their respective District.
- (2) Each lot of seed as defined in Section 2.10.3.3 will be sampled and tested.
- (3) Tested and approved seed stored for a period longer than nine (9) months, exclusive of the calendar month in which the test was completed, shall be resampled and retested for the percent germination.

- (4) Samples shall be drawn from unopened bags using the appropriate sampler (trier or probe) specified in Section 2.10.3.1.
- (5) Determine the lot identification and the number of bags in that lot actually in storage.
- (6) For lots of six (6) bags or less, each bag shall be sampled and a total of at least five (5) trierfuls shall be taken.
- (7) For lots of more than six (6) bags, five (5) bags plus ten percent (10%) of the number of bags in the lots shall be sampled at random. Regardless of the lot size, it is not necessary to sample more than thirty (30) bags.
- (8) Check the name of the seed and the lot number on the tag of each bag of seed before sampling to avoid mixing lots.
- (9) The sampler shall be fully inserted into the container so as to obtain a representative cross-section of its contents. Care shall be taken not to unduly tear the container when inserting the sampler. When possible, insert the sampler at a point where the seed exerts the least pressure on the container. Be careful when probing the width of a bag so as not to push the sampler through the opposite side. Holes made by the sampling instrument must be carefully resealed with pressure-sensitive tape to prevent loss and contamination of the seed.
- (10) The double tube trier sampler shall always be inserted in the closed position. After insertion, open the tube and allow seed to completely fill the sampler. Close the tube and extract the sample.
- (11) The open single tube probe sampler shall always be inserted with the slot down. After insertion, turn the slot up and allow seed to completely fill the sampler; then extract the sample.
- (12) The seed extracted from each container sampled in the lot shall be combined, thoroughly mixed, and quartered until a test specimen weighing approximately

one-quarter (1/4) pound is obtained.

- (13) The test specimen shall be placed in the approved sample container (Section 2.10.3.2 above) and shipped immediately to the following address:

State Seed Testing Laboratory  
P. O. Drawer S  
Mississippi State, MS 39762

- (14) The following information shall be submitted with each sample: project number, lot number, source, kind and variety, date sampled, place sampled, sampled by, sample number, quantity, test desired, and any other pertinent data.

#### **2.10.3.5 Care of Samples**

- (1) Seed are very sensitive and must be protected from rough handling and damage.
- (2) Seed shall be protected from high temperature, direct sunlight, dampness, and exposure to petroleum products as these factors can very quickly affect germination.
- (3) Samples shall be stored in a cool, dry place.

#### **2.10.4 Acceptance and Reporting of Seed by Certified Test Report**

**2.10.4.1** Seed shipped to a project that is accompanied by a Certified Test Report from the State Seed Laboratory shall be accepted by the Project Engineer. Upon receipt of the Certified Test Report, the Project Engineer shall enter the applicable information into a SiteManager Sample Record and complete the appropriate template (CPE 901—"Project Engineer Certification").

**2.10.4.2** The State Seed Testing Laboratory will submit their test report on each sample of seed to the Central Laboratory.

**2.10.4.3** The Central Laboratory will check the test results for conformance with the specifications and distribute the test reports as follows:

Original copy: Central Laboratory File;

1 copy: District Materials Engineer;

1 copy: Project Engineer;

1 copy: Contractor (sent to Project Engineer for distribution).

# MDOT INSPECTORS HANDBOOK

TMD-320  
Rev. 1-05

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION SAMPLE INFORMATION CARD

1. **SAMPLE ID:** \_\_\_\_\_
2. **SAMPLE DATE:** \_\_\_\_\_
3. **CONTRACT ID:** \_\_\_\_\_
4. **PROJECT (FMS) NO.:** \_\_\_\_\_
5. **PAY ITEM NO.:** \_\_\_\_\_
6. **SAMPLE TYPE:** \_\_\_\_\_
7. **MATERIAL:** \_\_\_\_\_
8. **APL PRODUCT NAME (if applicable):** \_\_\_\_\_
9. **PRODUCER/SUPPLIER NAME:** \_\_\_\_\_
10. **PLANT (if applicable):** \_\_\_\_\_
11. **QUANTITY REP.:** \_\_\_\_\_
12. **SAMPLE UNIT(S):** \_\_\_\_\_
13. **INTENDED USE:** \_\_\_\_\_
14. **STATION NO.:** \_\_\_\_\_
15. **SAMPLED BY:** \_\_\_\_\_
16. **REQUESTED BY:** \_\_\_\_\_
17. **SAMPLED FROM:** \_\_\_\_\_
18. **LOT/BATCH NO.:** \_\_\_\_\_
19. **MIX DESIGN TYPE/CLASS:** \_\_\_\_\_
20. **MIX ID:** \_\_\_\_\_
21. **TEST(S) DESIRED:** \_\_\_\_\_
22. **REMARKS:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### NOTES: SAMPLE INFORMATION CARD

1. The Sample ID is the ID number used by SiteManager. This number will be assigned by the Materials Division Central Lab for samples submitted by County & Consultant Engineers.
2. The date the sample was taken.
3. This is the SiteManager Contract ID number (as applicable).
4. The Project Number is the FMS 12-Digit Number /Construction Number.
5. The Pay Item Number is the Contract Pay Item associated with the Material Sample (MDOT Projects Only).
6. The Type of Sample Taken. Choose from the following types: Job Control, Information, Mix Design, QA, Stock, State Aid, Source Approval, Research, IAS, and Recheck.
7. Material Name and/or Description.
8. The Brand Name of the Material as listed on the Approved Products List (for applicable materials).
9. The Original manufacturer or approved supplier of the material. (Not the Broker or Vendor)
10. The name of the plant supplying the material, or the Plant Number for Aggregate Sources. List according to the City in which the plant is located. If there are multiple locations within the same city, include a street name for clarification.
11. The quantity of material used on the project represented by the sample, or maximum permitted by SOP No. TMD 20-04-00-000.
12. The unit of measure for the sample (i.e. feet, square feet, pounds, etc.).
13. The intended use of the sample, as applicable.
14. The station number of the sampling location, as applicable.
15. The person's name who took the sample.
16. The project engineer's name or other authorized party that authorized the sample to be tested.
17. The location at which the sample was taken, including but not limited to roadway location, stockpile, etc.
18. The unique identifier that corresponds to the manufacturer's lot and/or batch number, as applicable.
19. The Mix Design type and/or class, as applicable.
20. The ID number assigned to the approved mix design for the sample taken, as applicable.
21. Indicate if the requested testing should include the standard tests run on the sample (to be denoted as "REGULAR") and/or any specific tests that should be run on the sample. For example, "Regular plus soundness and abrasion".
22. Specify anything that might clarify sample information or explain conditions or the circumstances pertaining to the sample.

The fields appearing in red/bold are required for Sample Testing. Samples submitted without this information will not be tested. Refer to the NOTES Section of this form for further instruction.



# SiteManager Quick Reference

## Sample Information

Effective 03/18/2005 Page 1 of 4

### General Summary

The Sample Information window is used to track the collection of samples and test data results for both contract and non-contract specific materials. The Sample Information window is also used to track shipping tickets of certain pretested materials, or to enter project engineer certifications for those materials not requiring specific MDOT testing.

In MDOT, it will be the responsibility of the person who collects the sample to create a sample record on the Sample information window, entering all information into the first four folder tabs available at the time of the sample collection. If a sample is collected by a non-MDOT employee, the receiving clerk at the lab receiving the sample will create the sample record with the appropriate information supplied by the non-MDOT sampler.

### Steps—Basic Sample Data folder tab

1. On the **Main Panel**, double-click the **Sample Information** icon.

2. Click the **New** button.

3. The following fields are *required* information to complete a *new* record on this folder tab:

- a. Sample ID \*
- b. Sample Unit
- c. Status
- d. Sample Date
- e. Log Date
- f. Sample Type
- g. Acceptance Method
- h. Sampled By
- i. Material
- j. Producer/Supplier code – if selecting ENTER REMARKS, enter the name of the producer/supplier
- k. Town
- l. Geographic Area
- m. Represented Quantity

4. Enter the following fields *when applicable*:

- n. Link To
- o. Intended Use
- p. Product Name

5. Click the **Save** button.

### \* Sample ID Structure

The format for the Sample ID is as follows: **YYCCCCSSSXXXXQQ**

- ◆ YY = Last 2 digits of the year the sample was taken
- ◆ CCCC = your mail code
- ◆ SSS = your initials
- ◆ XXXX = next sequential number for samples you have created
- ◆ QQ = One of the following, as applicable:
  - Corrected copy - C1, C2, C3, etc.
  - IA Verification - V
  - IA Observation - W
  - Rechecks – R1, R2, R3, etc.
  - Split Samples – I for IA sample, J for job control sample



## SiteManager Quick Reference Sample Information

Effective 03/18/2005 Page 2 of 4

### Additional Sample Data Folder Tab Brief Summary

On this folder tab, the person completing the sample record may provide further details about the sample on this folder tab. For pretested materials and certified materials, the Sampled From and Sample Origin fields are not required for the sample record. The other fields available on this window should be populated when they apply.

### Steps – Additional Sample Data folder tab

1. On the **Maintain Sample Information** window, click the **Addtl Sample Data** folder tab.

2. The following fields are required data on this folder tab:

- Requested By
- Witnessed By
- Sampled From
- Sample Origin
- Design Type – only if sample is for a mix design
- Standard Remarks

3. Enter the following fields when applicable:

- Sample Size – optional field
- Dist. From Finished Grade
- Dist. From Finished Grade Unit of Measure
- Reference
- Station
- Offset
- Seal Number
- Plant ID

4. Click the **Save** button.

**Maintain Sample Information**

Basic Sample Data | **Addtl Sample Data** | Contract | Other | Tests

Smpl ID: 041717KAG0005 Buy American:  Spaces

Reqst By:  (a) Witnessed By:  (b)

Smpl Size:  (g) Spaces Dist from Grade:  (h) Spaces (i)

Station:  (k) Offset:  (l) Reference:  (j)

Smpld From:  (c)

Smpl Origin:  (d)

Control Type:  Cntrl Number:  Seal Number:  (m)

Design Type: Spaces (e) Mix ID:

Plant ID:  (n) Plant Type: Spaces

Creator User ID: ITIUSEF Include Standard Remarks:  (f)

Last Modified User ID: ITIUSEF Last Modified Date: 08/31/04



# SiteManager Quick Reference Sample Information

Effective 03/18/2005 Page 3 of 4

## Contract Folder Tab Brief Summary

Prior to submitting the sample for testing, the person who collected the sample must enter the contract details on this folder tab. This applies to samples that are associated to one or more contract pay items. Other than the Contract item associations, the only entry allowed is the quantity to be associated with the contract.

## Steps — Contract Folder Tab

1. On the **Sample Information** window, click the **Contract** folder tab.
2. Click the **New** button.
3. In the **Contract** list box, scroll to and double-click the applicable contract.
4. In the **Project** list box, scroll to and double-click the applicable line item number.
5. In the **Represented Quantity** field, enter the applicable quantity.
6. Click the **Save** button when all details have been input.

The following fields are required information on this folder tab:

- a. Contract ID
- b. Project
- c. Line Item
- d. Represented Quantity

Note: In MDOT, the Other folder tab will not be used at this time. There is no Quick Reference Guide written for this folder tab.

| Contract ID     | Project      | Line Item | Fed State Prj Nbr | Cont Est Matl Qty | Represented Qty | Material Unit | Reported Matl Qty | Line Item Desc               |
|-----------------|--------------|-----------|-------------------|-------------------|-----------------|---------------|-------------------|------------------------------|
| CMP-1078-290070 | 302528301000 | 0110      | CC00001558        | 0.000             | .000            | EACH          | 0.000             | Additional Construction Sign |



# SiteManager Quick Reference

## Sample Information

### Tests Folder Tab Brief Summary

Effective 03/18/2005 Page 4 of 4

The person performing the testing of the material will complete the information on this folder tab. This tab allows the user to identify the tests to be performed on the sample, enter the results of the tests, and track when the test starts and is completed. The Sample Test Number will be a sequential number (beginning with 1) for each instance of the same test method completed for the associated material. At the completion of a test record, the person who completed testing for the submitted sample will enter the Actual Completion Date and Testers information on this folder tab.

### Steps – Tests Folder Tab

First, associate the sample with the test:

1. On the **Sample Information** window, click the **Tests** folder tab.
2. In the **Test Method** field, perform a **Search** and double-click the applicable test method number.
3. In the **Lab ID** field, perform a **Search** and double-click the applicable lab identification number.
4. In the **Sample Test Nbr** field, type the appropriate sample test number.
5. Click the **Save** button to save your record.

Next, after the material has completed testing, come back to the **Tests** folder tab on the **Sample Information** window and input the required data:

1. Click the test method number (as input in Step #2 above).
2. Click the **Services** menu and click the **Enter/View Test Data** choice. A test template window will open for data entry. Some of these templates will be in the form of attachments (Excel, etc.) and some will be SiteManager Custom Templates.
3. Enter the Test data as required on the template and **update** or **save** the records. Click **Close** to return to the **Tests** folder tab.
4. Back on the **Tests** folder tab, enter the date the test was completed in the **Actual Completion Date** field.
5. Click the **Save** button.
6. Click the **Close** button.
7. **Don't forget**—The next step is to click the **Basic Sample Data** folder tab, and **change the Status field** to the appropriate selection.

| Test Method | Sample Test Nbr | Test Description                     |
|-------------|-----------------|--------------------------------------|
| FF0624      | 1               | Shipment of Pre-Tested Concrete Pipe |

Test Method: FF0624 Shipment of Pre-Tested Concrete Pipe  
 Lab ID: D7001 MDOT DISTRICT 7 MTLs LAB (27-01) - MCCOMB  
 Sample Test Nbr: 1  
 Charge Amount:   
 Start Date: 08/27/04  
 Estimated Completion Date: 00/00/00  
 Actual Completion Date: 00/00/00

The following fields are **required** information on the folder tab:

- a. Test Method
- b. Lab ID
- c. Sample Test Number
- d. Start Date
- e. Actual Completion Date

The following field should **NEVER** be completed at MDOT:

- f. Estimated Completion Date

**APPENDIX B**

**CONSTRUCTION TABLES & CHARTS**

## **PART VIII: Appendix B, Construction Tables and Charts**

### **Index of Construction Tables and Charts**

- B-1** Conversion of Minutes and Seconds to Decimal Parts of a Degree
- B-2** Weights and Measures
- B-3** Typical Township Subdivision
- B-4** Typical Subdivisions of a Section
- B-5** Table for Determining Volume of Liquid in a Partially Filled Cylindrical Tank
- B-6** Wind Chill Chart
- B-7** Table for Estimating Quantities of Bituminous Mixtures
- B-8** Decimal Parts of a Foot and Inch
- B-9** Random Sampling Table

**USEFUL TABLES AND CHARTS**

**CONVERSION OF MINUTES AND SECONDS  
TO DECIMAL PARTS OF A DEGREE**

| Minutes |          | Seconds |          | Minutes |          | Seconds |          |
|---------|----------|---------|----------|---------|----------|---------|----------|
| 0'      | 0.000000 | 0"      | 0.000000 | 30'     | 0.500000 | 30"     | 0.008333 |
| 1       | .016667  | 1       | .000278  | 31      | .516667  | 31      | .008611  |
| 2       | .033333  | 2       | .000556  | 32      | .533333  | 32      | .008889  |
| 3       | .050000  | 3       | .000833  | 33      | .550000  | 33      | .009167  |
| 4       | .066667  | 4       | .001111  | 34      | .566667  | 34      | .009444  |
| 5       | .083333  | 5       | .001389  | 35      | .583333  | 35      | .009722  |
| 6       | .100000  | 6       | .001667  | 36      | .600000  | 36      | .010000  |
| 7       | .116667  | 7       | .001944  | 37      | .616667  | 37      | .010278  |
| 8       | .133333  | 8       | .002222  | 38      | .633333  | 38      | .010556  |
| 9       | .150000  | 9       | .002500  | 39      | .650000  | 39      | .010833  |
| 10      | .166667  | 10      | .002778  | 40      | .666667  | 40      | .011111  |
| 11      | .183333  | 11      | .003056  | 41      | .683333  | 41      | .011389  |
| 12      | .200000  | 12      | .003333  | 42      | .700000  | 42      | .011667  |
| 13      | .216667  | 13      | .003611  | 43      | .716667  | 43      | .011944  |
| 14      | .233333  | 14      | .003889  | 44      | .733333  | 44      | .012222  |
| 15      | .250000  | 15      | .004167  | 45      | .750000  | 45      | .012500  |
| 16      | .266667  | 16      | .004444  | 46      | .766667  | 46      | .012778  |
| 17      | .283333  | 17      | .004722  | 47      | .783333  | 47      | .013056  |
| 18      | .300000  | 18      | .005000  | 48      | .800000  | 48      | .013333  |
| 19      | .316667  | 19      | .005278  | 49      | .816667  | 49      | .013611  |
| 20      | .333333  | 20      | .005556  | 50      | .833333  | 50      | .013889  |
| 21      | .350000  | 21      | .005833  | 51      | .850000  | 51      | .014167  |
| 22      | .366667  | 22      | .006111  | 52      | .866667  | 52      | .014444  |
| 23      | .383333  | 23      | .006389  | 53      | .883333  | 53      | .014722  |
| 24      | .400000  | 24      | .006667  | 54      | .900000  | 54      | .015000  |
| 25      | .416667  | 25      | .006944  | 55      | .916667  | 55      | .015278  |
| 26      | .433333  | 26      | .007222  | 56      | .933333  | 56      | .015556  |
| 27      | .450000  | 27      | .007500  | 57      | .950000  | 57      | .015833  |
| 28      | .466667  | 28      | .007778  | 58      | .966667  | 58      | .016111  |
| 29      | .483333  | 29      | .008056  | 59      | .983333  | 59      | .016389  |

EXAMPLE:  $0^{\circ} 21' 09'' = 0.350000 + 0.002500 = 0.352500^{\circ}$

## WEIGHTS AND MEASURES

### Volume Equivalents

| Cubic Inches | Cubic Feet | Cubic Yards | Liters  | U.S. Gallons | British Imperial Gallons |
|--------------|------------|-------------|---------|--------------|--------------------------|
| 1            | 0.0005787  | 0.00002143  | 0.01639 | 0.004329     | 0.003605                 |
| 1,728.0      | 1          | 0.03704     | 28.32   | 7.481        | 6.229                    |
| 46,656.0     | 27.0       | 1           | 764.6   | 202.0        | 168.2                    |
| 61.02        | 0.03531    | 0.001308    | 1       | 0.2642       | 0.220                    |
| 231.0        | 0.1337     | 0.004951    | 3.785   | 1            | 0.8327                   |
| 277.4        | 0.1605     | 0.005946    | 4.546   | 1.201        | 1                        |

### Weight Equivalent

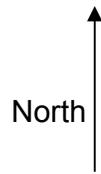
| Ounces (Avoirdupois) | Pounds (Avoirdupois) | Short Tons | Long Tons  | Metric Tons | Kilograms |
|----------------------|----------------------|------------|------------|-------------|-----------|
| 1                    | 0.0625               | 0.00003125 | 0.00002790 | 0.00002835  | 0.02835   |
| 16.0                 | 1                    | 0.0005000  | 0.0004464  | 0.0004536   | 0.4536    |
| 32,000.0             | 2,000.0              | 1          | 0.8929     | 0.9072      | 907.2     |
| 35,840.0             | 2,240.0              | 1.12       | 1          | 1.016       | 1.016     |
| 35,274.              | 2,204.6              | 1.102      | 0.9842     | 1           | 1,000.0   |
| 35.27                | 2.205                | 0.001102   | 0.0009842  | 0.001       | 1         |

### Linear Measure Equivalents

| Inches   | Feet    | Yards   | Meters  | Rods     | Kilometers | Miles      |
|----------|---------|---------|---------|----------|------------|------------|
| 1        | 0.08333 | 0.02778 | 0.02540 | 0.005051 | 0.00002540 | 0.00001578 |
| 12.0     | 1       | 0.3333  | 0.3048  | 0.06061  | 0.0003048  | 0.0001894  |
| 36.0     | 3.0     | 1       | 0.9144  | 0.1818   | 0.0009144  | 0.0005682  |
| 39.37    | 3.281   | 1.094   | 1       | 0.1988   | 0.001000   | 0.0006214  |
| 198.0    | 16.5    | 5.5     | 5.029   | 1        | 0.005029   | 0.003125   |
| 39,370.0 | 3,280.8 | 1,093.6 | 1,000.0 | 1,98.8   | 1          | 0.6214     |
| 63,360.0 | 5,280.0 | 1,760.0 | 1,609.3 | 320.0    | 1.609      | 1          |

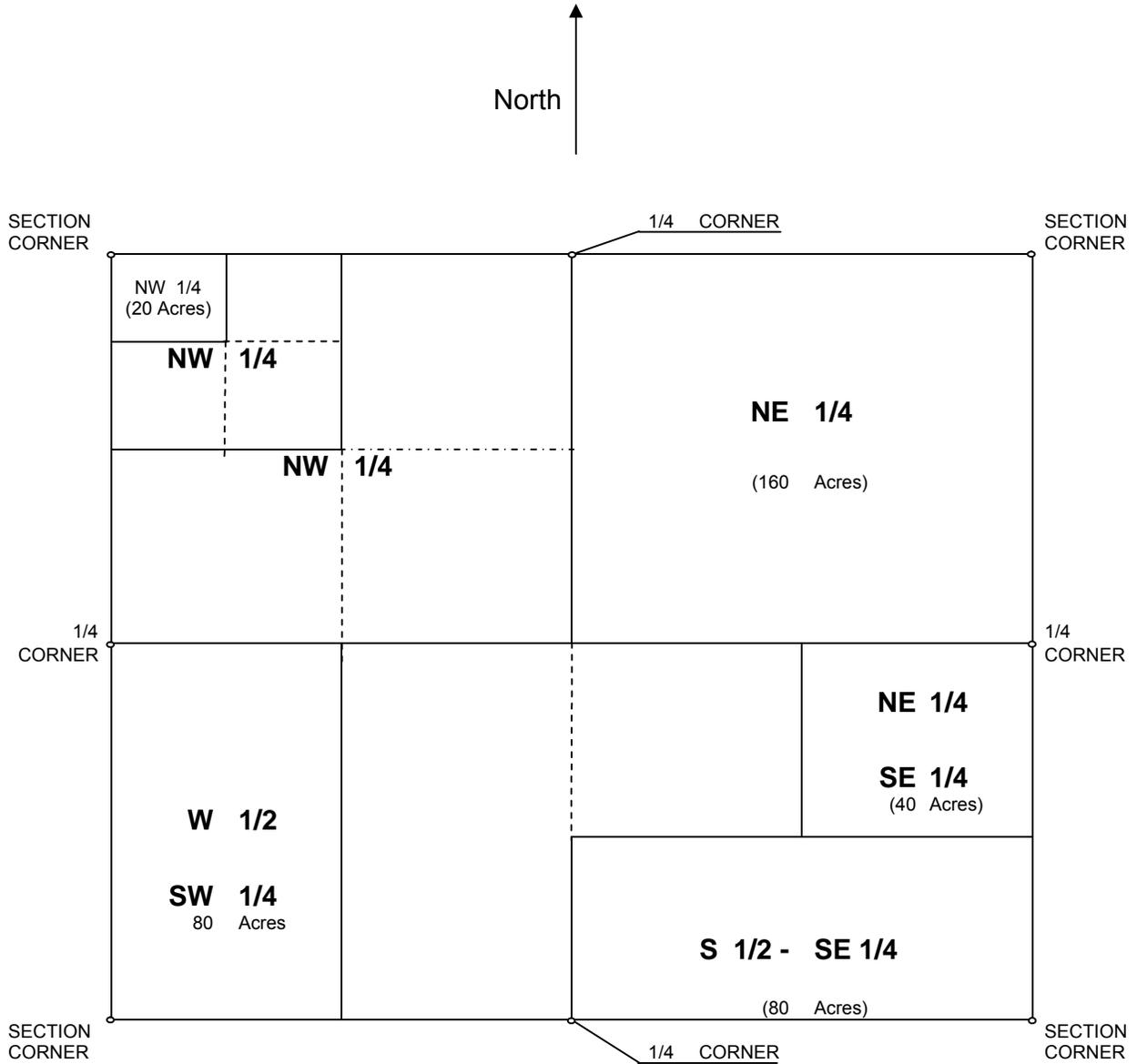
### Square Measure Equivalents

| Square Inches | Square Feet | Square Yards | Square Meters | Square Rods | Acres      | Square Miles |
|---------------|-------------|--------------|---------------|-------------|------------|--------------|
| 1             | 0.006944    | 0.0007716    | 0.0006452     | 0.000025511 | -----      | -----        |
| 144.0         | 1           | 0.1111       | 0.09290       | 0.003673    | 0.00002296 | -----        |
| 1,296.0       | 9.0         | 1            | 0.8361        | 0.03306     | 0.0002066  | -----        |
| 1,550.        | 10.76       | 1.196        | 1             | 0.03954     | 0.0002471  | -----        |
| 39,204        | 272.25      | 30.25        | 25.29         | 1           | 0.006250   | -----        |
| 6,272,640     | 43,560      | 4,840.       | 4,047         | 160         | 1          | 0.001562     |
| -----         | -----       | 3,097,600    | 2,589,998     | 102,400.0   | 640.0      | 1            |



|              | R12W | R11W   |    |    |    |    | R11W | R10W   |
|--------------|------|--|----|----|----|----|------|--|
| T<br>10<br>N | 36   | R<br>A<br>I<br>N<br>G<br>E<br>L<br>I<br>N<br>E<br>31 | 32 | 33 | 34 | 35 | 36   | R<br>A<br>I<br>N<br>G<br>E<br>L<br>I<br>N<br>E<br>31 |
|              |      |  |    |    |    |    |      | TOWNSHIP<br>LINE<br>6                                |
| T<br>9<br>N  | 1    | 6  | 5  | 4  | 3  | 2  | 1    | 6  |
|              | 12   | 7  | 8  | 9  | 10 | 11 | 12   | 7  |
|              | 13   | 18   | 17 | 16 | 15 | 14 | 13   | 18   |
|              | 24   | 19   | 20 | 21 | 22 | 23 | 24   | 19   |
|              | 25   | 30   | 29 | 28 | 27 | 26 | 25   | 30   |
| T<br>9<br>N  | 36   | 31   | 32 | 33 | 34 | 35 | 36   | 31   |
|              |      |  |    |    |    |    |      | TOWNSHIP<br>LINE<br>6                                |
| T<br>8<br>N  | 1    | 6  | 5  | 4  | 3  | 2  | 1    | 6  |

Typical Township Subdivision



- Not to Scale -

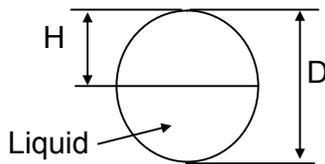
**Typical Subdivisions of a Section**

TC-5

TABLE FOR DETERMINING VOLUME OF LIQUID IN  
A PARTIALLY FILLED CYLINDRICAL TANK

The below listed values may be used for any cylindrical tank under the following conditions:

1. The capacity and diameter are known.
2. The tank is in a level position.
3. The ends of the tank are planes normal to the longitudinal axis



| RATION<br>H/D | PERCENT<br>CAPACITY | RATIO<br>H/D | PERCENT<br>CAPACITY | RATIO<br>H/D | PERCENT<br>CAPACITY |
|---------------|---------------------|--------------|---------------------|--------------|---------------------|
| 0.0           | 100.00              | 0.34         | 70.02               | 0.67         | 28.78               |
| 0.01          | 99.83               | 0.35         | 68.81               | 0.68         | 27.59               |
| 0.02          | 99.52               | 0.36         | 67.59               | 0.69         | 26.40               |
| 0.03          | 99.13               | 0.37         | 66.36               | 0.70         | 25.23               |
| 0.04          | 98.66               | 0.38         | 65.13               | 0.71         | 24.07               |
| 0.05          | 98.13               | 0.39         | 63.89               | 0.72         | 22.92               |
| 0.06          | 97.55               | 0.40         | 62.65               | 0.73         | 21.78               |
| 0.07          | 96.92               | 0.41         | 61.40               | 0.74         | 20.66               |
| 0.08          | 96.25               | 0.42         | 60.14               | 0.75         | 19.55               |
| 0.09          | 95.54               | 0.43         | 58.88               | 0.76         | 18.46               |
| 0.10          | 94.80               | 0.44         | 57.62               | 0.77         | 17.38               |
| 0.11          | 94.02               | 0.45         | 56.36               | 0.78         | 16.31               |
| 0.12          | 93.20               | 0.46         | 55.09               | 0.79         | 15.27               |
| 0.13          | 92.36               | 0.47         | 53.82               | 0.80         | 14.24               |
| 0.14          | 91.49               | 0.48         | 52.55               | 0.81         | 13.23               |
| 0.15          | 90.59               | 0.49         | 51.27               | 0.82         | 12.24               |
| 0.16          | 89.67               | 0.50         | 50.00               | 0.83         | 11.27               |
| 0.17          | 88.73               | 0.51         | 48.73               | 0.84         | 10.33               |
| 0.18          | 87.76               | 0.52         | 47.45               | 0.85         | 9.41                |
| 0.19          | 86.77               | 0.53         | 46.18               | 0.86         | 8.51                |
| 0.20          | 85.76               | 0.54         | 44.91               | 0.87         | 7.64                |
| 0.21          | 84.73               | 0.55         | 43.64               | 0.88         | 6.80                |
| 0.22          | 83.69               | 0.56         | 42.38               | 0.89         | 5.99                |
| 0.23          | 82.62               | 0.57         | 41.12               | 0.90         | 5.20                |
| 0.24          | 81.55               | 0.58         | 39.86               | 0.91         | 4.46                |
| 0.25          | 80.45               | 0.59         | 38.60               | 0.92         | 3.75                |
| 0.26          | 79.34               | 0.60         | 37.35               | 0.93         | 3.08                |
| 0.27          | 78.22               | 0.61         | 36.11               | 0.94         | 2.45                |
| 0.28          | 77.08               | 0.62         | 34.87               | 0.95         | 1.87                |
| 0.29          | 75.93               | 0.63         | 33.64               | 0.96         | 1.34                |
| 0.30          | 74.77               | 0.64         | 32.41               | 0.97         | 0.87                |
| 0.31          | 73.60               | 0.65         | 31.19               | 0.98         | 0.48                |
| 0.32          | 72.41               | 0.66         | 29.98               | 0.99         | 0.17                |
| 0.33          | 71.22               |              |                     | 1.00         | 0.00                |

EXAMPLE: 1200 gallon tank, 60 inches in diameter, distance (h) from top of tank to liquid is 15 inches.  $h/d$  ratio =  $15/60 = 0.25$ . From Table: Opposite  $h/d$  ratio of 0.25, percent capacity = 80.45. Volume of liquid =  $0.8045 \times 1200 = 965.4$  gallons.

(Not to be used in lieu of Required Calibration).

### WIND-CHILL CHART

| Estimated<br>Wind Speed<br>MPH  | EQUIVALENT TEMPERATURE °F                       |    |    |     |                      |     |     |     |              |      |      |      |
|---|---|----|----|-----|----------------------|-----|-----|-----|--------------|------|------|------|
|   | ACTUAL THERMOMETER READING °F                   |    |    |     |                      |     |     |     |              |      |      |      |
|   | 50  | 40 | 30 | 20  | 10                   | 0   | -10 | -20 | -30          | -40  | -50  | -60  |
| Calm  | 50  | 40 | 30 | 20  | 10                   | 0   | -10 | -20 | -30          | -40  | -50  | -60  |
| 5   | 48  | 37 | 27 | 16  | 6                    | -5  | -15 | -26 | -36          | -47  | -57  | -68  |
| 10  | 40  | 28 | 16 | 5   | -9                   | -21 | -33 | -46 | -58          | -70  | -83  | -95  |
| 15  | 36  | 22 | 9  | -5  | -18                  | -36 | -45 | -58 | -72          | -85  | -99  | -112 |
| 20  | 32  | 18 | 4  | -10 | -25                  | -39 | -53 | -67 | -82          | -96  | -110 | -124 |
| 25  | 30  | 16 | 0  | -15 | -29                  | -44 | -59 | -74 | -88          | -104 | -118 | -133 |
| 30  | 28  | 13 | -2 | -18 | -33                  | -48 | -63 | -79 | -94          | -109 | -125 | -140 |
| 35  | 27  | 11 | -4 | -20 | -35                  | -49 | -67 | -82 | -98          | -113 | -129 | -145 |
| 40  | 26  | 10 | -6 | -21 | -37                  | -53 | -69 | -85 | -100         | -116 | -132 | -148 |
| Wind Speeds<br>greater<br>than 40 MPH<br>have little<br>additional effect | Little Danger For<br>Properly Clothed<br>Person |    |    |     | Increasing<br>Danger |     |     |     | Great Danger |      |      |      |
|   | DANGER FROM FREEZING OF EXPOSED<br>FLESH        |    |    |     |                      |     |     |     |              |      |      |      |

To use the chart, find the estimated or actual wind speed in the left-hand column and the actual temperature in degrees F in the top row. The equivalent temperature is found where these two intersect. For example, with a wind speed of 20 mph and a temperature of 40°F, the equivalent temperature is 18°F and persons working outside should be clothed accordingly.

**TABLE FOR ESTIMATING QUANTITIES OF BITUMINOUS MIXTURES**

| Tons/Mile @ 110 lbs. per S.Y. per in. |       |      |       |      |        |      |      |        |        |        |      |        |
|---------------------------------------|-------|------|-------|------|--------|------|------|--------|--------|--------|------|--------|
| Tons to Sq. Yd.                       |       | .027 | .030  | .032 | .037   | .041 | .055 | .079   | .082   | .096   | .110 | .137   |
| Width                                 | Sy/Mi | 1/2" | 9/16" | 5/8" | 11/16" | 3/4" | 1"   | 1 1/4" | 1 1/2" | 1 3/4" | 2"   | 2 1/2" |
| 18                                    | 1056  | 291  | 327   | 363  | 399    | 436  | 580  | 727    | 872    | 1017   | 1161 | 1452   |
| 20                                    | 1173  | 322  | 363   | 404  | 443    | 484  | 645  | 807    | 967    | 1129   | 1291 | 1631   |
| 21                                    | 1232  | 339  | 381   | 423  | 466    | 508  | 678  | 847    | 1017   | 1185   | 1355 | 1694   |
| 22                                    | 1290  | 355  | 399   | 444  | 488    | 532  | 710  | 888    | 1065   | 1242   | 1420 | 1774   |
| 23                                    | 1349  | 371  | 417   | 464  | 511    | 557  | 742  | 927    | 1114   | 1299   | 1485 | 1856   |
| 24                                    | 1408  | 387  | 436   | 484  | 532    | 580  | 774  | 968    | 1163   | 1354   | 1548 | 1935   |
| 25                                    | 1466  | 405  | 454   | 504  | 555    | 605  | 806  | 1008   | 1210   | 1411   | 1613 | 2016   |
| 26                                    | 1525  | 419  | 471   | 524  | 577    | 630  | 839  | 1049   | 1258   | 1468   | 1677 | 2097   |
| 27                                    | 1584  | 436  | 490   | 544  | 599    | 653  | 871  | 1088   | 1307   | 1524   | 1742 | 2178   |
| 28                                    | 1642  | 452  | 508   | 565  | 621    | 678  | 904  | 1129   | 1355   | 1581   | 1807 | 2259   |
| 29                                    | 1701  | 467  | 526   | 584  | 643    | 701  | 936  | 1169   | 1403   | 1637   | 1872 | 2339   |
| 30                                    | 1760  | 484  | 544   | 605  | 666    | 726  | 968  | 1210   | 1453   | 1694   | 1937 | 2421   |
| 31                                    | 1818  | 500  | 563   | 626  | 687    | 750  | 1000 | 1249   | 1500   | 1750   | 2000 | 2500   |
| 32                                    | 1877  | 517  | 580   | 645  | 710    | 774  | 1032 | 1291   | 1549   | 1806   | 2064 | 2581   |
| 33                                    | 1936  | 532  | 599   | 666  | 732    | 798  | 1065 | 1332   | 1597   | 1863   | 2129 | 2662   |
| 34                                    | 1994  | 548  | 617   | 686  | 754    | 823  | 1097 | 1371   | 1645   | 1920   | 2194 | 2742   |
| 36                                    | 2112  | 580  | 653   | 726  | 798    | 871  | 1162 | 1452   | 1742   | 2033   | 2324 | 2904   |
| 38                                    | 2229  | 623  | 689   | 766  | 843    | 919  | 1227 | 1532   | 1840   | 2146   | 2453 | 3066   |

**NOTE:** The above values are based on 110 lbs. per sq. yd. per inch thickness, which value is usually used in estimating the tonnage on the plans. The actual compacted-in-place values range from approximately 105 lbs. to 110 lbs. for the neat dimension of the theoretical section. 110 lbs. is used in estimating in order to allow for a reasonable angle of repose at the edges.

**DECIMAL PARTS OF A FOOT AND INCH**

| DECIMAL PARTS OF A FOOT |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Inches                  | 0"    | 1"    | 2"    | 3"    | 4"    | 5"    | 6"    | 7"    | 8"    | 9"    | 10"   | 11"   | Ins.  |
|                         | .0000 | .0833 | .1667 | .2500 | .3333 | .4167 | .5000 | .5833 | .6667 | .7500 | .8333 | .9167 |       |
| 1/32                    | .0026 | .0859 | .1693 | .2526 | .3359 | .4193 | .5026 | .5859 | .6693 | .7526 | .8359 | .9193 | 1/32  |
| 1/16                    | .0052 | .0885 | .1719 | .2552 | .3385 | .4219 | .5052 | .5885 | .6719 | .7552 | .8385 | .9219 | 1/16  |
| 3/32                    | .0078 | .0911 | .1745 | .2578 | .3411 | .4245 | .5078 | .5911 | .6745 | .7578 | .8411 | .9245 | 3/32  |
| 1/8                     | .0104 | .0938 | .1771 | .2604 | .3438 | .4271 | .5104 | .5938 | .6771 | .7604 | .8423 | .9271 | 1/8   |
| 5/32                    | .0103 | .0964 | .1797 | .2630 | .3464 | .4297 | .5130 | .5964 | .6797 | .7630 | .8464 | .9297 | 5/32  |
| 3/16                    | .0156 | .0990 | .1823 | .2656 | .3490 | .4323 | .5156 | .5990 | .6823 | .7656 | .8490 | .9323 | 3/16  |
| 7/32                    | .0182 | .1016 | .1849 | .2682 | .3516 | .4349 | .5182 | .6016 | .6849 | .7682 | .8516 | .9349 | 7/32  |
| 1/4                     | .0208 | .1042 | .1875 | .2708 | .3542 | .4375 | .5208 | .6042 | .6875 | .7708 | .8542 | .9375 | 1/4   |
| 9/32                    | .0234 | .1068 | .1901 | .2734 | .3568 | .4401 | .5234 | .6068 | .6901 | .7734 | .8568 | .9401 | 9/32  |
| 5/16                    | .0260 | .1094 | .1927 | .2760 | .3594 | .4427 | .5260 | .6094 | .6927 | .7760 | .8594 | .9427 | 5/16  |
| 11/32                   | .0286 | .1120 | .1953 | .2786 | .3620 | .4453 | .5286 | .6120 | .6953 | .7786 | .8620 | .9453 |       |
| 3/8                     | .0313 | .1146 | .1979 | .2813 | .3646 | .4479 | .5313 | .6146 | .6979 | .7813 | .8646 | .9479 | 3/8   |
| 13/32                   | .0339 | .1172 | .2005 | .2839 | .3672 | .4505 | .5339 | .6172 | .7005 | .7839 | .8672 | .9505 | 13/32 |
| 7/16                    | .0365 | .1198 | .2031 | .2865 | .3698 | .4531 | .5365 | .6198 | .7031 | .7865 | .8698 | .9531 | 7/16  |
| 15/32                   | .0391 | .1224 | .2057 | .2891 | .3724 | .4557 | .5391 | .6224 | .7057 | .7891 | .8724 | .9557 | 15/32 |
| 1/2                     | .0417 | .1250 | .2083 | .2917 | .3750 | .4583 | .5417 | .6250 | .7083 | .7917 | .8750 | .9583 | 1/2   |
| 17/32                   | .0443 | .1276 | .2109 | .2943 | .3776 | .4609 | .5443 | .6276 | .7109 | .7943 | .8776 | .9609 | 17/32 |
| 9/16                    | .0469 | .1302 | .2135 | .2969 | .3802 | .4635 | .5469 | .6302 | .7135 | .7969 | .8802 | .9635 | 9/16  |
| 19/32                   | .0495 | .1328 | .2161 | .2995 | .3828 | .4661 | .5495 | .6328 | .7161 | .7995 | .8828 | .9661 | 19/32 |
| 5/8                     | .0521 | .1354 | .2188 | .3021 | .3854 | .4688 | .5521 | .6354 | .7188 | .8021 | .8854 | .9688 | 5/8   |
| 21/32                   | .0547 | .1380 | .2214 | .3047 | .3880 | .4714 | .5547 | .6380 | .7214 | .8047 | .8880 | .9714 | 21/32 |
| 11/16                   | .0573 | .1406 | .2240 | .3073 | .3906 | .4740 | .5573 | .6406 | .7240 | .8073 | .8906 | .9740 | 11/16 |
| 13/32                   | .0599 | .1432 | .2266 | .3099 | .3932 | .4766 | .5599 | .6432 | .7266 | .8099 | .8932 | .9766 | 13/32 |
| 3/4                     | .0625 | .1458 | .2292 | .3125 | .3958 | .4792 | .5625 | .6458 | .7292 | .8125 | .8958 | .9792 | 3/4   |
| 25/32                   | .0651 | .1484 | .2318 | .3151 | .3984 | .4818 | .5651 | .6484 | .7318 | .8151 | .8984 | .9818 | 25/32 |
| 13/16                   | .0677 | .1510 | .2344 | .3177 | .4010 | .4844 | .5677 | .6510 | .7344 | .8177 | .9010 | .9844 | 13/16 |
| 27/32                   | .0703 | .1536 | .2370 | .3203 | .4036 | .4870 | .5703 | .6536 | .7370 | .8203 | .9036 | .9870 | 27/32 |
| 7/8                     | .0729 | .1563 | .2396 | .3229 | .4063 | .4896 | .5729 | .6563 | .7396 | .8229 | .9063 | .9896 | 7/8   |
| 29/32                   | .0755 | .1589 | .2422 | .3255 | .4089 | .4922 | .5755 | .6589 | .7422 | .8255 | .9089 | .9922 | 29/32 |
| 15/16                   | .0781 | .1615 | .2448 | .3281 | .4115 | .4948 | .5781 | .6615 | .7448 | .8281 | .9115 | .9948 | 15/16 |
| 31/32                   | .0807 | .1641 | .2474 | .3307 | .4141 | .4974 | .5807 | .6641 | .7474 | .8307 | .9141 | .9974 | 31/32 |

**RANDOM SAMPLING TABLE**

| Random Numbers |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                | 1   |     | 2   |     | 3   |     | 4   |     | 5   |     | 6   |     | 7   |     |
| 1              | 815 | 722 | 048 | 964 | 248 | 826 | 665 | 147 | 767 | 147 | 133 | 870 | 796 | 957 |
|                | 296 | 205 | 680 | 264 | 469 | 208 | 897 | 815 | 866 | 126 | 922 | 571 | 804 | 252 |
|                | 007 | 573 | 390 | 664 | 846 | 400 | 328 | 613 | 989 | 960 | 647 | 645 | 960 | 982 |
|                | 053 | 042 | 256 | 264 | 444 | 440 | 379 | 639 | 457 | 661 | 754 | 665 | 346 | 904 |
|                | 919 | 264 | 641 | 943 | 267 | 259 | 399 | 222 | 715 | 645 | 914 | 424 | 078 | 696 |
| 2              | 005 | 047 | 879 | 773 | 422 | 351 | 740 | 995 | 818 | 426 | 438 | 766 | 620 | 766 |
|                | 007 | 698 | 627 | 561 | 863 | 880 | 762 | 360 | 846 | 931 | 760 | 658 | 779 | 880 |
|                | 690 | 657 | 958 | 552 | 189 | 273 | 265 | 086 | 408 | 599 | 298 | 801 | 127 | 485 |
|                | 259 | 579 | 298 | 886 | 679 | 487 | 189 | 822 | 654 | 697 | 336 | 542 | 859 | 035 |
|                | 097 | 834 | 735 | 129 | 308 | 183 | 282 | 357 | 059 | 416 | 349 | 378 | 389 | 880 |
| 3              | 915 | 425 | 279 | 301 | 040 | 863 | 298 | 997 | 555 | 848 | 290 | 092 | 796 | 732 |
|                | 179 | 563 | 909 | 491 | 200 | 599 | 061 | 205 | 180 | 020 | 737 | 835 | 361 | 427 |
|                | 465 | 185 | 188 | 496 | 023 | 510 | 206 | 587 | 281 | 154 | 569 | 533 | 205 | 873 |
|                | 921 | 896 | 948 | 781 | 846 | 828 | 099 | 254 | 441 | 484 | 255 | 212 | 355 | 204 |
|                | 145 | 627 | 356 | 812 | 396 | 473 | 568 | 563 | 616 | 495 | 896 | 201 | 774 | 180 |
| 4              | 984 | 075 | 333 | 642 | 016 | 924 | 669 | 984 | 048 | 455 | 465 | 041 | 468 | 457 |
|                | 349 | 639 | 887 | 827 | 344 | 170 | 875 | 408 | 324 | 700 | 706 | 888 | 777 | 693 |
|                | 700 | 282 | 394 | 464 | 232 | 534 | 949 | 258 | 699 | 948 | 196 | 728 | 001 | 667 |
|                | 539 | 549 | 069 | 672 | 683 | 829 | 113 | 428 | 802 | 882 | 473 | 466 | 065 | 978 |
|                | 760 | 295 | 409 | 073 | 587 | 257 | 229 | 800 | 399 | 961 | 411 | 142 | 606 | 595 |
| 5              | 907 | 522 | 839 | 299 | 658 | 388 | 504 | 837 | 556 | 143 | 317 | 573 | 562 | 415 |
|                | 643 | 674 | 333 | 319 | 148 | 244 | 597 | 923 | 974 | 892 | 359 | 041 | 237 | 519 |
|                | 089 | 003 | 316 | 253 | 616 | 340 | 812 | 356 | 568 | 693 | 483 | 455 | 785 | 817 |
|                | 950 | 683 | 935 | 707 | 105 | 045 | 764 | 543 | 023 | 172 | 288 | 147 | 627 | 922 |
|                | 156 | 104 | 204 | 383 | 911 | 219 | 595 | 816 | 271 | 482 | 467 | 229 | 322 | 856 |
| 6              | 164 | 818 | 041 | 533 | 794 | 214 | 830 | 923 | 366 | 312 | 596 | 917 | 727 | 023 |
|                | 186 | 819 | 055 | 919 | 047 | 130 | 976 | 248 | 947 | 064 | 350 | 048 | 867 | 982 |
|                | 731 | 351 | 474 | 876 | 990 | 710 | 888 | 710 | 187 | 202 | 231 | 729 | 351 | 430 |
|                | 574 | 167 | 231 | 493 | 450 | 331 | 125 | 410 | 807 | 453 | 448 | 125 | 989 | 912 |
|                | 304 | 839 | 237 | 144 | 150 | 457 | 227 | 197 | 099 | 743 | 686 | 304 | 707 | 254 |
| 7              | 166 | 350 | 859 | 982 | 323 | 523 | 168 | 692 | 827 | 384 | 738 | 325 | 419 | 444 |
|                | 967 | 202 | 425 | 789 | 053 | 221 | 243 | 542 | 350 | 196 | 110 | 914 | 603 | 197 |
|                | 389 | 642 | 143 | 826 | 665 | 441 | 006 | 355 | 359 | 191 | 633 | 296 | 033 | 598 |
|                | 316 | 763 | 174 | 533 | 441 | 644 | 647 | 753 | 765 | 316 | 126 | 330 | 603 | 923 |
|                | 789 | 194 | 236 | 278 | 479 | 025 | 376 | 208 | 721 | 393 | 348 | 089 | 850 | 878 |
| 8              | 039 | 333 | 570 | 742 | 634 | 173 | 628 | 399 | 056 | 912 | 688 | 255 | 388 | 469 |
|                | 744 | 332 | 439 | 101 | 899 | 156 | 528 | 738 | 731 | 886 | 889 | 744 | 518 | 993 |
|                | 090 | 009 | 207 | 954 | 926 | 454 | 095 | 888 | 165 | 511 | 793 | 975 | 162 | 660 |
|                | 422 | 124 | 870 | 142 | 209 | 045 | 645 | 313 | 860 | 294 | 476 | 059 | 524 | 168 |
|                | 161 | 080 | 265 | 417 | 819 | 656 | 742 | 563 | 000 | 671 | 775 | 706 | 287 | 341 |

**APPENDIX C**  
**CONCRETE FIELD TEST METHODS**  
**(Print Edition Only)**

**PART IX: Appendix C, Concrete Field Test Methods  
(Print Edition Only)**

**Index of Concrete Field Test Methods**

- C-1** AASTHO T-119, Slump of Hydraulic-Cement Concrete
- C-2** AASHTO T-152, Air Content of Freshly Mixed Concrete by the Pressure
- C-3** AASHTO T 196, Air Content of Freshly Mixed Concrete by the Volumetric Method