

Appendix C – Materials Division Standard Operating Procedures

Note: The Standard Operating Procedures listed below were referenced in this manual and are included for convenience. To review additional Materials Division SOPs or check for the latest version, please see the Official Standard Operating Procedures section of MDOT@Work (MDOT's Intranet Site).

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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.	Dated
TMD-20-03-00-000	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>TYPE OF CONSTRUCTION</u>	<u>OPERATION</u>	<u>STANDARD LOT SIZE</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 (Classes A, B, C)	Density	2500 L. F. (each layer)
Portland Cement-Treated Courses	Density	Note (2)
		2500 L. F. (each layer)
Mechanically Stabilized Courses	Density	Note (2)
Lime-Fly Ash Treated Courses	Density	2500 L. F. (each layer)
		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 Soil	Density	1,000 L. F.

Annotations:
Commission Order:

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.

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. TMD-20-04-00-000	Dated May 01, 2005
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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.

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:

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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

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ITEM NO.	ITEM	MATERIAL OR TEST	FREQUENCY	SAMPLED BY	TESTED BY
224	Soil Reinforcing Mat	Mat	Manufacturer's Certification; MDOT APL		
		Pins, Staples	Manufacturer's Certification		
225	Grassing	Fertilizer	Guaranteed Analysis		
		Seeds	Certified Analysis on Each Bag (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

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

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:

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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)

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:

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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:

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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		

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:

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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

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		

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		

ITEM NO.	ITEM	MATERIAL OR TEST	FREQUENCY	SAMPLED BY	TESTED BY
		Backer Rod	3' Sample Each Shipment; 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; 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:

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ITEM NO.	ITEM	MATERIAL OR TEST	FREQUENCY	SAMPLED BY	TESTED BY
		Precast Units	Roadway Design Division Approval of Shop Drawings; then Pretested	Jackson	Jackson
602	Reinforcement	Reinforcing Steel	Pretested See Note (7); 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 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:

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

ITEM NO.	ITEM	MATERIAL OR TEST	FREQUENCY	SAMPLED BY	TESTED BY
		Staples	1# Sample	District	Jackson
		Tension Wire	6' Sample; Domestic Origin	District	Jackson
		Tie Wire	6' Sample; Domestic Origin	District	Jackson
		Chain Link	Certified Test Report and 3' Sample; Domestic Origin	District	Jackson
		Non-Metal Post & Lumber	Pretested		
		Gates, Aluminum Slatted	Manufacturer's Certification 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; 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

Annotations:

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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:

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

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		

Annotations:

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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		

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

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

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.	See Item No. 601		
		Wood Posts	Pretested		
		All Metals, Etc.	Manufacturer's Certified Test Report; Domestic Origin		
		Reflectorized Materials	Manufacturer's Certification; MDOT APL		
631	Flowable Fill	Mix Design	Each	Contractor	Jackson
		Cement	Cert. A or B; 1 gallon sample each 500 C.Y.; MDOT APL	District	Jackson
		Water	1-1/2 pint sample each source	District	Jackson
		Fly Ash	Cert. And 1 gallon sample each 2000 C.Y.	District	Jackson
		Aggregate	1 per 500 C.Y.; MDOT APL	District	District
634-686	Traffic Signal and Illumination Systems-General	Concrete	See Item No. 601		

Annotations:

Commission Order: 121633

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

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; Domestic Origin		
803	Bearing Piles	Concrete:			
		(1) Precast	See Item No. 804		
		(2) Drilled Shafts	See Item No. 804		
		Steel	Mill Test Report; 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

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

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		

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 See Note (7)		
		Plastic Concrete Testing	See Note (11)	Contractor; District	Contractor; District
		Neoprene Bearing Pads	Certificate & 1 Pad per Lot 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 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 See Note (7)		

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; OR A Sample of each Component for Approval & then Certification each Shipment	District	Jackson
809	Retaining Walls				
	Conventional:	Concrete Items	See Item No. 804		
		Backfill	75 lb. Initial Sample; Source Approval; Density (Ea. Lift)	District	District
	MSE:	Precast Concrete Panels	Cert. Test Reports (compressive strength)		
		Modular Blocks: - 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

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
	Gravity:	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		

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.

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 Treatment100 cu. yds.
- (2) Granular Material1,000 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:

(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.

S.O.P. No.: **TMD-06-01-00-000**

Mississippi Department of Transportation - Standard Operating Procedures

Subject: **INDEPENDENT ASSURANCE SAMPLING AND TESTING**

Effective Date: **November 10, 2009**
Issued Date: **November 10, 2009**

Supersedes S.O.P. **INITIAL DISTRIBUTION** Dated

PURPOSE: To establish uniform procedures for the Independent Assurance Sampling and Testing Program as required in Federal-Aid Policy Guide 23 CFR 637B.

1. General

The Materials Division is responsible for operation of an independent assurance sampling and testing program meeting the requirements of Federal-Aid Policy Guide, 23 CFR 637B. To accomplish this, the State Materials Engineer maintains a staff of Independent Assurance Samplers. The proper and efficient administration of this program requires cooperation between the Independent Assurance Section, the District Materials Laboratory, and the District Project Office. Independent Assurance sampling and testing will be conducted on all Federal Aid Projects on the National Highway System and any state funded project as directed by the State Materials Engineer.

2. Organization and Personnel

The Independent Assurance (IA) Sampling and Testing Program is the direct responsibility of the State Materials Engineer. The Central Laboratory will maintain a staff of Independent Assurance Samplers: a Chief of the Independent Assurance Sample Section, who is selected by the State Materials Engineer, and six (6) Independent Assurance Samplers. One Independent Assurance Sampler will be located in each District. These employees must have the following qualifications:

- 1) Fully trained and experienced in the proper standard methods of sampling materials.
- 2) Maintain the appropriate Concrete and Hot Mix Asphalt Technician Certifications.
- 3) Fully trained and experienced in standard field test methods.
- 4) Of unquestioned integrity and character.

Vacancies will be refilled in accordance with current state policies in cooperation with the District in which they work.

The Chief of the Independent Assurance Sample Section will supervise and coordinate the work of the Independent Assurance Samplers, will furnish necessary information and assistance, and will supplement the work of the Independent Assurance Samplers when necessary.

All testing supplies and equipment required by the Independent Assurance Sampler will be furnished by the Central Laboratory.

The District shall provide adequate office and laboratory space for the Independent Assurance Sampler, including required office furniture, filing cabinet(s), and office supplies, as necessary for the efficient accomplishment of required duties.

3. Sampling Procedures

3.1 General – Independent Assurance Sampling and Testing will be conducted on the materials and at the minimum frequency outlined in TMD-06-02-00-000 – Approximate Frequencies for Independent Assurance Sampling and Testing. The sampling and testing frequencies are considered to be the minimum. The IA Sampler may obtain additional samples as considered necessary. Additional samples may be called for by the State Materials Engineer, Chief of the Independent Assurance Section, District Personnel, or FHWA Representatives. All sampling and testing shall be conducted according to the appropriate AASHTO or Mississippi Test Method.

Annotations:

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The IA Sampler shall be certified and experienced in the proper methods of field sampling and testing. As part of their duties, the IA Sampler will observe methods of sampling and testing by Project Office or District Office technicians. Observed variations from standard procedures should be pointed out to the technician and if necessary to the Project Engineer, the District Materials Engineer, and/or the State Materials Engineer.

3.2 Equipment – The IA Sampler will be furnished the following equipment to carry out sampling and testing duties.

- 1) Materials Splitter and sample mat
- 2) Electronic Thermometer
- 3) Slump Cone and rod
- 4) Concrete air meter
- 5) Pan and bucket
- 6) Nuclear Density Gauge

3.3 Independent Assurance Sampling Checklist – The Chief of the Independent Assurance Section will supervise and coordinate the work of the IA Samplers, will furnish necessary information and assistance, and will supplement the work of IA Samplers when necessary.

Upon generation of a contract in SiteManager, an e-mail notification is sent by Contract Administration Division notifying District Office and Central Office personnel that a new contract is loaded into SiteManager. At this point, the District Materials Engineer is able to generate the materials for the contract. Once the materials have been generated, the IA Section Chief is responsible for running within SiteManager the Independent Assurance Sampling Checklist.

The Independent Assurance Sampling Checklist will be given to the IA Sampler as soon as possible after materials have been generated in SiteManager. The IA Sampler will use the checklist as a guide to assure that the minimum sampling and testing frequencies outlined in TMD-06-02-00-000 are met. The checklist can be run by the IA Section Chief or the IA Sampler as many times as necessary through the life of the project to check the progress of the IA sampling program.

Upon receipt of the IA Sampling Checklist, the IA Sampler will contact the District Materials Engineer and the Project Engineer. Open communication between the IA Sampler and project personnel is essential. The Project Engineer should be made aware of the types of IA samples which will be required for the project. As work on the project progresses, regular communication between the Project Engineer and the IA Sampler is required to assure necessary IA sampling and testing is conducted.

Upon approval of a Supplemental Agreement Contract Administration makes the appropriate changes to SiteManager. Changes can include quantity adjustments to existing line items or addition of line items that could require adjustment of the IA Sampling Checklist. Materials Division receives written notification when a Supplemental Agreement is approved. Upon receipt, the Chief of the Independent Assurance Section is routed a copy of the Supplement Agreement. If the Supplemental Agreement affects the IA Sampling, a new IA Sampling Checklist shall be generated and a copy distributed to the IA Sampler responsible for the project.

3.4 Documentation of Sample, Test, and Observation Information in SiteManager – Documentation of samples, test results, and observations by the IA Sampler will be within SiteManager. Detailed instruction on how to enter sample data, complete test templates, and run process reports is found within current SiteManager documentation.

3.5 Split Sampling – As many of the IA samples as possible shall be the result of splitting a job control acceptance sample with the appropriate Quality Control, Quality Assurance, or Construction, Engineering, and Inspection (CE&I) Technician. Such sampling and splitting shall be performed by

the technician on the project under the observation of the IA Sampler. Personnel from the project shall retain half of the sample which may be used for job acceptance. The IA Sampler shall retain the other half of the sample to be tested in the Central Lab. In the case of Hot Mix Asphalt, the sample shall be split in accordance with these provisions and the *MDOT Field Manual for Hot Mix Asphalt*.

The IA Sampler will generate the SiteManager ID Number for both the project Job Control Sample and the IA Sample and give the number to the project personnel at the time the sample is taken. Identification of both parts of the split sample is essential to the comparison process. Care should be taken by both the IA Sampler and the project personnel to assure that the correct sample ID is included in SiteManger.

On projects in which the Construction, Engineering, and Inspection (CE&I) is contracted to an outside firm, IA samples shall be split with the CE&I Firm. Such sampling and splitting shall be performed by the technician on the project under the observation of the IA Sampler. The IA Sampler will give the CE&I technician the appropriate sample ID number to identify the sample as one for future comparison. If the project is being managed by the CE&I firm within SiteManager, then they will be responsible for entering the appropriate sample record within SiteManager utilizing the sample ID generated by the IA Sampler. In the event the CE&I firm does not have access to SiteManager, the CE&I firm shall submit the completed job control test data to the District Materials Engineer as soon as possible after completion of the test. Upon receipt of the test data, the District Materials Engineer will complete the comparison between the job control sample and the IA sample.

3.6 IA Sampling of Materials Tested in Accordance with QC/QA Specifications –

3.6.1 Concrete Specified by Section 804 of the Standard Specifications is sampled, tested, and ultimately accepted by a process of Quality Control (QC) Testing conducted by the Contractor and Quality Assurance (QA) Testing conducted by MDOT. The independent QA sampling and testing serves as verification of the Contractor's test results. Sampling by the Independent Assurance Section of Materials Division provides a check on equipment and testing procedures used in the acceptance of materials.

Involvement by the IA Sampler on jobs containing concrete tested in accordance with QC/QA Specifications falls into the following categories:

1. split sampling of concrete with QC and QA
2. laboratory equipment calibration checks of the QC Laboratory
3. observation of QC tests

At the required frequency, the IA Sampler shall obtain plastic concrete samples from the job site in accordance with the *MDOT Concrete Field Manual* utilizing the appropriate AASHTO Sampling Methods. The sample may be split with the QC Technician or with the District (QA). At a minimum, IA samples shall be obtained at the frequencies outlined in TMD-SOP-06-02-00-000. In addition, at least one sample shall be split with both QC and QA for each concrete mixture type on the project.

When the purpose of the concrete split sample is to compare to the QC, the IA Sampler shall either obtain and split or observe the QC Technician obtain and split a sample in accordance with the *MDOT Concrete Field Manual*. The QC portion of the split sample may be used for job control acceptance and values from the testing of the sample used for acceptance and pay. The IA Sampler shall instruct the QC Technician to fax or e-mail the split sample test results to the Central Laboratory to the attention of the IA Section Chief upon completion of testing. After the initial curing period, the IA Sampler shall transport the IA portion of the split sample to the Central Laboratory for strength testing.

Comparison of test results by the Central Laboratory to the QC are to be completed by the IA Section Chief in accordance with the allowable variations established in Section 6. Unfavorable comparisons shall be evaluated by the IA Section Chief, District Materials

Engineer, and the Concrete Field Engineer. Results of the evaluation along with any corrective actions taken as a result of the evaluation shall be documented on the appropriate Form TMD-890.

When the purpose of the concrete split sample is to compare to the QA, the IA Sampler shall either obtain and split or observe the QA Technician obtain and split a sample in accordance with the *MDOT Concrete Field Manual*. After the initial curing period, the QA portion of the split sample shall be transported to the District Laboratory for testing. Samples split with QA may not be used to verify the Contractor's test results. Separate, independent samples must be used for that purpose. The IA Sampler shall give the QA Technician the SiteManager Sample ID to use for the sample record. Upon completion of the strength testing, the District Lab will enter the test data into the sample record. The IA Sampler shall transport the IA portion of the split sample to the Central Laboratory for testing.

Upon completion of testing by the District and Central Lab, the District Materials Engineer or their representative shall complete the comparison of the test results in accordance with the allowable variations established in Section 6. Unfavorable comparisons shall be evaluated by the District Materials Engineer, the IA Section Chief, and the Concrete Field Engineer. Results of the evaluation shall be documented on the appropriate Form TMD-890.

- 3.6.2** Hot Mix Asphalt (HMA) Specified in Sections 401 and 403 of the Standard Specifications is sampled, tested, and ultimately accepted by a process of Quality Control (QC) Testing conducted by the Contractor and Quality Assurance (QA) Testing conducted by MDOT. The independent QA sampling and testing serves as verification of the Contractor's test results. Sampling by the Independent Assurance Section of Materials Division provides a check on equipment and testing procedures used in the acceptance of materials.

Involvement by the IA Sampler on jobs containing Hot Mix Asphalt falls into three categories:

1. split sampling of the plant produced HMA with QC and QA
2. laboratory equipment calibration checks of the QC Laboratory
3. observation of QC tests

At the required frequency, the IA Sampler shall obtain HMA samples from the plant in accordance with the *MDOT Field Manual for Hot Mix Asphalt*. The sample may be split with the QC Technician or split and transported to the District Lab for the purpose of comparison with the District (QA). At a minimum, at least one sample shall be split with both QC and QA for each mixture type on the project.

When the purpose of the HMA split sample is to compare to the QC, the IA Sampler shall either obtain and split or observe the QC Technician obtain and split a sample in accordance with the *MDOT Field Manual for Hot Mix Asphalt*. The QC portion of the split may be used for job control acceptance and values from the testing of the sample used for acceptance and pay. The split sample shall be taken at the next QC sample tonnage as determined by the random number chart. For this reason coordination between the QC technician and the IA Sampler is essential. The IA Sampler shall instruct the QC Technician to fax or e-mail the split sample test results to the Central Laboratory to the attention of the IA Section Chief upon completion of testing. The IA Sampler shall transport the IA portion of the split sample to the Central Laboratory for testing.

When the purpose of the HMA split sample is to compare to the QA, the IA Sampler shall either obtain and split or observe the QA Technician obtain and split a sample in accordance with the *MDOT Field Manual for Hot Mix Asphalt*. Both halves of the split sample shall be retained by the IA Sampler. The QA portion of the split sample shall be transported to the

District Laboratory for testing. Samples split with QA may not be used to verify the Contractor's test results. Separate, independent samples must be used for that purpose. The IA Sampler shall instruct the QA Technician to fax or e-mail the split sample test results to the Central Laboratory to the attention of the IA Section Chief upon completion of the testing. The IA Sampler shall transport the IA portion of the split sample to the Central Laboratory for testing.

Comparison of test results by the Central Laboratory to QC or QA Laboratory results are to be completed by the IA Section Chief in accordance with the allowable variations established in Section 6. Unfavorable comparisons shall be evaluated by the IA Section Chief, District Materials Engineer, and the Hot Mix Asphalt Engineer. Results of the evaluation along with any corrective actions taken as a result of the evaluation shall be documented on the appropriate Form TMD-890.

In addition to obtaining split samples of the HMA, the IA Sampler is also responsible for observing normal job control sampling and testing procedures in the laboratory and on the roadway. Observations of job control testing are documented in SiteManager.

4. Testing Procedures

Field testing shall be conducted according to the specified AASHTO or Mississippi Test Method and at or above the frequency outlined in TMD-06-02-00-000 – Approximate Frequencies for Independent Assurance Sampling and Testing. It is the responsibility of the IA Sampler to be well versed in each test procedure. The IA sampler will maintain MDOT field testing certifications in the areas of concrete and hot-mix asphalt. The required certifications are MDOT Class I Concrete Technician and Certified Asphalt Technician-I (CAT-I).

5. Quality Control Laboratory Checks

The IA Sampler will check the condition and/or calibration of testing equipment used in the field or in quality control laboratories involved in acceptance of materials.

5.1 Field Testing Equipment – Periodically through the duration of a project the IA Sampler shall check the following field testing equipment used in the acceptance of materials for any given project: concrete air meters, slump cones, nuclear density devices, and other equipment to assure that it is in proper working condition. Any equipment found to be in disrepair shall be reported to the Project Engineer or District Materials Engineer.

5.2 Concrete Quality Control Laboratories – Concrete QC Laboratories shall be checked by the IA Sampler at least once during production of concrete for a given project. The IA Sampler shall check the condition and calibration of the concrete breaking machine. If the breaking machine is found to be in disrepair or does not have a current calibration certificate, the IA Sampler should immediately notify the strength testing technician. The IA Sampler should conduct a follow-up inspection approximately one week after the initial inspection to insure that the noted deficiencies have been corrected. If after the second inspection, all deficiencies have not been addressed, the IA Sampler shall document in writing the deficiency and provide documentation to the IA Section Chief, District Materials Engineer, and the State Materials Engineer.

5.3 Hot Mix Asphalt Quality Control Laboratories – Hot Mix Asphalt QC Laboratories shall be checked by the IA Sampler at least once during the production of HMA for a given project. The IA Sampler shall check the condition and calibration of equipment as outlined in the Hot Mix Asphalt Field Manual and document the results within SiteManager. If equipment is found to be in disrepair or does not have a current calibration certificate, the IA Sampler should immediately notify the QC Manager and the District QA Technician. The IA Sampler should conduct a follow-up inspection approximately one week after the initial inspection to insure that the noted deficiencies have been corrected. If after the second inspection, all deficiencies have not been addressed, the IA Sampler shall document in writing the deficiency and provide documentation to the IA Section Chief, District Materials Engineer, and the

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State Materials Engineer.

5.4 Accuracy Check of Balances by IA Samplers – Each Independent Assurance Sampler will be furnished the necessary test weights with which to spot check balances used in Quality Control Laboratories. The IA Sampler shall check balances in QC Laboratories in connection with tests and observations reported within SiteManager. Results of the IA balance checks will be reported in SiteManager by the IA Sampler.

6. Comparison of Job Control and Independent Assurance Sample Test Results

6.1 General – With the exception of HMA, comparison of job control acceptance test results with independent assurance sample test results is the direct responsibility of the District Materials Engineer. The District Materials Engineer shall furnish completed copies of Form TMD-890 for each comparison of job control acceptance test results with independent assurance test results to the State Materials Engineer immediately upon completion of all testing included on the appropriate TMD-890. Form TMD-890 shall show the results of the comparison, the cause of any unfavorable comparison, and, when unfavorable, the corrective action taken. Upon completion of the project, the District Materials Engineer shall submit Form TMD-891 to the State Materials Engineer listing and certifying that a comparison of independent assurance sample test results with job control acceptance sample results was performed.

Comparisons made on HMA are the direct responsibility of the IA Section Chief. The IA Section Chief shall furnish completed copies of Form TMD-890 for each comparison made on HMA to the State Materials Engineer with a copy to the District Materials Engineer immediately upon completion of all tests. Results of HMA comparisons will be included on Form TMD-891 submitted by the District Materials Engineer upon completion of the project.

Forms TMD-890 and TMD-891 are generated by running the appropriate process within SiteManager. The comparison of materials within SiteManager is made utilizing the maximum variation for favorable comparison values that follow. The values are valid only on single test results performed by two technicians on a split sample.

6.2 Allowable Variations for Comparison of Split Samples

<u>Material and Characteristic</u>	<u>Maximum Variation for Favorable Comparison</u>
I. <u>Soils and Granular Materials</u>	
A. Gradation plus No. 10 Material	
1. Passing No. 10 and larger sieves	5%
B. Material finer than No. 10 sieve (100% basis)	
1. Percent Passing No. 40	4%
2. Percent Passing No. 60	4%
3. Percent Passing No. 200	5%
C. Liquid Limit	8%
D. Plastic Limit	5%
E. Optimum Moisture	3%
F. Standard Density (pounds per cubic foot)	5
II. <u>Gradation of Fine Aggregate</u>	

A.	Percent Passing 3/8-inch	2%
B.	Percent Passing No. 4	3%
C.	Percent Passing No. 8	3%
D.	Percent Passing No. 16	3%
E.	Percent Passing No. 30	6%
F.	Percent Passing No. 50	5%
G.	Percent Passing No. 100	2%

III. Gradation of Coarse Aggregate

A.	Percent Passing 1 1/2-inch	4%
B.	Percent Passing 1-inch	6%
C.	Percent Passing 3/4-inch	7%
D.	Percent Passing 1/2-inch	6%
E.	Percent Passing 3/8-inch	5%
F.	Percent Passing No. 4	2%
G.	Percent Passing No. 8	2%

IV. Crushed Stone Bases

A.	Size 610:	
	Percent Passing 1-inch	6%
	Percent Passing 3/4-inch	7%
	Percent Passing 1/2-inch	6%
	Percent Passing 3/8-inch	5%
	Percent Passing No. 4	3%
	Percent Passing No. 40	4%
	Percent Passing No. 200	5%

B. Size 825

Passing 1 1/2-inch	4%	Percent
Percent Passing 1-inch	6%	
Percent Passing 1/2-inch	5%	
Percent Passing No. 4	3%	
Percent Passing No. 8	3%	
Percent Passing No. 16	6%	
Percent Passing No. 50	4%	
Percent Passing No. 200	5%	

C. Size 3/4-inch and Down

Percent Passing 3/8-inch	5%
Percent Passing No. 4	3%
Percent Passing No. 10	4%
Percent Passing No. 40	4%
Percent Passing No. 200	5%

V. Hot Mix Asphalt Paving Mixtures

A.	Asphalt Cement Content	0.4%
B.	Maximum Specific Gravity	0.020
C.	Bulk Specific Gravity	0.030
D.	Gradation of Extracted Mineral Aggregates	

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Percent Passing 3/8 inch and larger	6.0%
Percent Passing No. 4	5.0%
Percent Passing No. 8	5.0%
Percent Passing No. 16 (For 4.75 mm mixtures only)	4.0%
Percent Passing No. 30	4.0%
Percent Passing No. 200	3.0%

VI. Asphalt Drainage Course

A. Asphalt Cement Content	0.4%
B. Gradation of Extracted Mineral Aggregate	
Percent Passing 1/2-inch and larger	6.0%
Percent Passing No. 4	5.0%
Percent Passing No. 8	5.0%
Percent Passing No. 200	3.0%

VII. Concrete – Allowable variations for concrete specified in Sections 601 or 804 of the Standard Specifications.

A. Concrete cylinder breaks	990 psi
B. Slump	1 inch
C. Air content	1%

S.O.P. No.: **TMD-06-02-00-000** Mississippi Department of Transportation - Standard Operating Procedures

Subject: **APPROXIMATE FREQUENCIES FOR INDEPENDENT ASSURANCE SAMPLING AND TESTING**

Effective Date: **November 24, 2009**
Issued Date: **November 24, 2009**

Supersedes S.O.P.	Dated
INITIAL DISTRIBUTION	

PURPOSE: To establish a schedule for determining the approximate number of Independent Assurance Samples to be obtained on Federally funded projects on the National Highway System in compliance with Federal-Aid Policy Guide, 23 CFR 637B.

1. General

The guidance provided herein is for determining the minimum sampling and testing required on projects to be sampled and tested by the Independent Assurance Section of Materials Division. At the State Materials Engineer's discretion, the schedule of frequencies for sampling and testing may be adjusted or adapted to specific project needs. It is the responsibility of the State Materials Engineer and the Independent Assurance Section Chief to assure compliance with these guidelines.

2. Sampling and Testing

2.1 Independent Assurance Sampling Checklist – Shortly after a contract is generated within SiteManager, the IA Section Chief will generate an IA Sampling Checklist in accordance with TMD-06-01-00-000. This checklist shall be used by the IA Sampler to estimate the minimum number and type of samples required for the project. Under certain circumstances, the State Materials Engineer may modify the IA Sampling Checklist to assure proper coverage of the overall Independent Assurance Program. Supplemental Agreements may require that an updated IA Sampling Checklist be generated by the IA Section Chief.

The IA Sampler shall make every effort to obtain the required samples and perform the required tests according to the IA Sampling Checklist. To accomplish the goals of the Independent Assurance Program, communication between the IA Section Chief, IA Sampler, and MDOT District Personnel is critical.

2.2 Split Samples – Split Samples shall be obtained and documented in accordance with TMD-06-01-00-000. Samples of material shall be split with the appropriate Quality Control (QC), Quality Assurance (QA), or Construction Engineering and Inspection (CE&I) Technician. When practical, the IA Sampler and the technician conducting job control sampling and testing may jointly obtain samples of material for testing. The material should be split in accordance with applicable AASHTO and Mississippi Test Methods. Once split, the sample shall be documented in SiteManager.

With the exception of samples split with QA Technicians, test results from split samples may be used for job acceptance. Samples split with QA may not be used to verify the Contractor's test results. Separate, independent samples must be used for that purpose. All other split samples may be used by project personnel for the purpose of acceptance and pay.

2.3 Field Testing – The IA Sampler is responsible for field testing materials as required in Section 3.2. Field Tests conducted by the IA Sampler should be performed as close as possible to tests conducted for job control acceptance. At his discretion, the IA Sampler may observe the District of Project Office technician conducting job control field testing. Each observation of field testing shall be documented within SiteManager. The IA Sampler is required to personally conduct at least one test of each type or a minimum of 10% of the required number on the IA Sample Checklist.

3. Schedule of Independent Assurance Section Sampling Frequencies

3.1 General – Independent Assurance Samples and Field Testing of materials shall be sampled and tested according to the following minimum frequencies. The required frequencies are considered to be the minimum coverage needed to meet the goals of the Independent Assurance Program. Samples of material shall be split with the appropriate Quality Control, Quality Assurance, or CE&I Technician in accordance with TMD-06-01-00-000.

Special conditions that require modification of the required minimum frequencies are as follows:

- 1) No IA density samples are required for layers scheduled for chemical treatment prior to the chemical treatment.
- 2) No IA samples are required for granular material used for shoulder leveling on overlay projects.
- 3) No IA samples are required for Pay Items covered under TMD-20-05-00-000, *Sampling and Testing of Small Quantities of Miscellaneous Materials*.

3.2 Independent Assurance Sampling Frequency Table

<u>MATERIAL OR OPERATION</u>	<u>TESTS REQUIRED</u>	<u>FREQUENCY</u>	<u>WHEN OR WHERE</u>
Embankments & Design Soil			
	Gradation	3 per class borrow	In Place
	Density Note (1)	1 per 100,000 cy, min. 2 per project	In Place
	Proctor	1 per class of borrow	In Place
	LL, PI	3 per class borrow	In Place
<hr/>			
Subgrades:	Chemically-Treated Soils		
	Density Note (1)	1 per 50,000 sy, min. 2 per project	In place
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Base:	Untreated Granular Materials		
	Density, Gradation, PI Note (1)	1 each 10,000 cy or 14,000 tons, min. 2 per project	In place
	Mechanically-Stabilized Base		
	Density Note (1)	1 per 50,000 sy, min. 2 per project	In place, After mixing
	Composite Gradation, PI	1 each 10,000 cy or 14,000 tons, min. 2 per project	In place, After mixing
	Chemically Treated Bases		
	Density Note (1)	1 per 50,000 sy, min. 2 per project	In place After mixing

Concrete, Structural: Aggregates	Gradation and Cleanliness	1 each aggregate per 1000 cu. yds concrete or min. 1 per project	At Concrete Plant
Field Tests	Comp. Strength Slump, % Air (if used)	1 cylinder each 1000 cy concrete, min. 1 split with QC and 1 split with QA per project, per Class (Note 2)	Before placing
Reinforcing Steel:	Physical Tests (structures)	1 each 50 tons, min. 1 per bar size	Project Site
Concrete, Paving: Aggregates	Gradation and Cleanliness	1 per 70,000 sy	At Concrete Plant
Field Tests	Compressive Strength, Slump % Air (if used)	1 per 70,000 sy Note (2)	Before placing
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Surface Treatments: Aggregates	Quality Tests	1 each 3,000 cy or 4,200 tons; min. 1 each per project	Stockpile at Project Site
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Hot Mix Asphalt: Mixture	AC, VMA, Total Voids Extraction, Gradation	1 each 10,000 tons for each mix type. Minimum of 1 split with QC and 1 split with QA per project per mix type (minimum of 1 sample per mix type regardless of tonnage).	Asphalt Plant
	Note (1)		
Roadway	Density Note (1)	1 each 10,000 tons for each mix type (excluding irregular areas and volumes under 2,000 tons)	In place
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Asphalt Drainage Course: Aggregate	Gradation	1 per 45,000 sy	Asphalt Plant (Belt Sample)
Mixture	AC Content	1 per 45,000 sy	Asphalt Plant (Truck Sample)

Prestressed Concrete (Excluding Piles) (Note 3):

Aggregates	Gradation and Cleanliness	1 every 3 months	At Concrete Batch Plant
Field Tests	Compressive Strength and Slump Note (2)	1 every 3 months	At Prestress Plant
Reinforcement	Prestress Strand Spiral Wire Reinforcing Steel	1 every 3 months	At Prestress Plant

**SPECIFIC NOTES REFERENCED IN SCHEDULE FOR
INDEPENDENT ASSURANCE SAMPLING AND TESTING**

- (1) Observation of HMA testing conducted by QC, QA, or CE&I Technicians for density, AC Content, total voids, and VMA tests shall be completed by the IA Sampler. Tests observed by the IA Sampler shall be documented within SiteManager. Observation of acceptance testing shall be done in addition to split sampling of HMA mixture.
- (2) IA concrete cylinders samples may be split with QC, QA, or CE&I Technicians. If concrete cylinders made for IA Comparison are not made by the IA Sampler, sampling procedures shall be observed by the IA Sampler; likewise, the slump and air content tests may be performed by project personnel, but observed by the IA Sampler. Observation of tests conducted by QC, QA, or CE&I technicians conducting acceptance testing shall be included within the IA Sampler's documentation. All split samples and observations of test procedures shall be documented within SiteManager. Observation of acceptance testing shall be done in addition to split sampling and testing of concrete cylinders.
- (3) IA samples taken at prestressed concrete plants shall show the project number for which the units are being cast. When practical, the Independent Assurance Sampler and Prestress Inspector will jointly obtain a sample of material; the sample will be "split" with one (1) part tested as an independent assurance sample, the other as a quality assurance sample. Samples shall be obtained only when production is for Department projects.