

# VDOT AGGREGATE DATABASE: MITS/PLAID

2020 Mid-Atlantic Quality Assurance Workshop

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# WHAT IS MITS/PLAID?

## **MITS/PLAID is**

- **A centralized online database where Central Mix Aggregate (CMA) and Hot Mix Asphalt (HMA) job mixes and sample results are submitted and approved**
- **Can be viewed by the Department and the Producer.**

## **MITS: Materials Information Tracking System**

- **Department Side**

## **PLAID: Producer Lab Analysis and Information Detail**

- **Producer Side**

# MILESTONES

- **Started in 2011**
- **Went through 3 development phases**
  - **Phase I - HMA portion (2012)**
  - **Phase II - CMA portion (2013)**
  - **Phase III – Daily Weight Summary Sheet (TL102), D2S, Control Charts, Quality Management Report, etc. (2015)**
- **In Maintenance phase now - Continuing upgrades (Automated Upload/Submission, VTM-1 report, etc.)**

# WHAT HAS CHANGED

Before

After

<i>MS Access database</i>	<i>Web-based database</i>
<i>Job mix formulas are keyed to system by VDOT</i>	<i>Job mix formulas are keyed to system by Producer</i>
<i>VDOT verifies approved suppliers and design/spec ranges</i>	<i>System verifies approved suppliers and design/spec ranges</i>
<i>Acceptance test data (QC data) entered by VDOT</i>	<i>Acceptance test data (QC data) entered by Producer</i>
<i>Acceptance test data received when picked up by QA Technician at plant</i>	<i>Acceptance test data keyed or interfaced to the web portal within 48 hours of sampling</i>
<i>QA Technician must review all reports to determine if results are positive or adverse</i>	<i>System notifies QA technician if results are positive or adverse</i>

# WHAT HAS CHANGED

## Before

## After

<i>QA Technician must notify Producer of price adjustments or adverse IA test results</i>	<i>Producer can see price adjustments and IA test results on the web portal immediately when they are “released” by VDOT</i>
<i>Producer manages their own control charts</i>	<i>System creates control charts</i>
<i>Each QA Technician retains manual records of investigation, findings, and corrective actions</i>	<i>Investigative activities, findings, corrective actions and final resolution are recorded in the system</i>
<i>QA Technicians manually provide information on flagged results for FHWA reporting at year-end</i>	<i>Information on flagged results is stored in the system and automatically pulled to FHWA reports</i>
<i>Daily 102 production data reports picked up by VDOT when visiting plant</i>	<i>Producer keys 102 production data to web portal within 1 working day (paper copy is printed from system and sent to project site)</i>

# OVERVIEW

- **Number of Active Accounts – CMA and HMA : 574 (as of May 2019)**
  - **406 Producer users**
  - **168 VDOT users**
- **Number of Samples tested**

	<b>2019</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>
Producer QC samples	4345	6191	8691	7781	7686
VDOT IA samples	1137	1496	2011	1796	1628
Total	5482	7687	10702	9577	9314

# VDOT Spec – Base Aggregate

- Design Range for Dense-Graded Aggregate**

Amounts Finer Than Each Laboratory Sieve (Square Openings <sup>1</sup> ) (% by Weight)							
Size No.	2 in	1 in	3/8 in.	No. 10	No. 40	No. 200	ASTM D4791 Flat & Elongated 5:1
21A	100	94-100	63-72	32-41	14-24	6-12	30% max.
21B	100	85-95	50-69	20-36	9-19	4-7	30% max.
22	---	100	62-78	39-56	23-32	8-12	30% max.

- Max allowable LL =30 and PI =6 (for Aggregate Type I)**
- Lots of 2000 tons or 4000 tons used**
- Determination of gradation and Atterberg limits is based on a mean of the results of tests performed on four samples taken in a stratified random manner from each lot**

## VDOT Spec – Base Aggregate

- A lot is considered acceptable for grading if the mean of the test results is within the deviation from the job-mix formula specified in Table II-10

TABLE II-10  
Process Tolerances for Each Laboratory Sieve (%)

No. Tests	Top Size	1 in	3/4 in.	3/8 in.	No. 10	No. 40	No. 200
1	0.0	±10.0	±14.0	±19.0	±14.0	±8.0	±4.0
2	0.0	±7.1	±10.0	±13.6	±10.0	±5.7	±2.9
3	0.0	±5.6	±7.8	±10.6	±7.8	±4.4	±2.2
4	0.0	±5.0	±7.0	±9.5	±7.0	±4.0	±2.0
8	0.0	±3.6	±5.0	±6.8	±5.0	±2.9	±1.4

- If a lot of material does not conform to the acceptance requirements payment adjustment points will be determined

# VDOT Spec – Base Aggregate

- **Atterberg limits**
- **A lot is considered acceptable for Atterberg limits if the mean of the test results is less than the maximum for LL and PI in Table II-11**

Max. Liquid Limit		Max. Plasticity Index	
No. Tests	Subbase and Aggregate Base Type I and II	Subbase Sizes No. 21A, 22, and Aggregate Base Type II	Aggregate Base Type I and Subbase Size No. 19
1	25.0	6.0	3.0
2	23.9	5.4	2.4
3	23.2	5.1	2.1
4	23.0	5.0	2.0
8	22.4	4.7	1.7

# VDOT Spec – Base Aggregate

- **The variability of the total quantity furnished is determined on the basis of the standard deviation for each sieve size.**

TABLE II-12  
Standard Deviation

Sieve Size	1 Adjustment Point for Each Sieve Size	2 Adjustment Points for Each Sieve Size	3 Adjustment Points for Each Sieve Size
2 in	0.6-1.5	1.6-2.5	2.6-3.5
1 in	4.6-5.5	5.6-6.5	6.6-7.5
3/4 in	5.6-6.5	6.6-7.5	7.6-8.5
3/8 in	7.1-8.0	8.1-9.0	9.1-10.0
No. 10	5.6-6.5	6.6-7.5	7.5-8.5
No. 40	3.6-4.5	4.6-5.5	5.6-6.5
No. 200	3.1-4.0	4.1-5.0	5.1-6.0

# MIT/ PLAID – Home



## Materials Information Tracking System

Home

[Home](#) | 
 [CMA Program](#) | 
 [HMA Program](#) | 
 [Administration](#) | 
 [Help](#)

### Notification

Filter existing records by:  Include Hidden Notifications
 Notification Type: All

Notification Search Results (165384 found)

Sent	Type	From	Message	Link	Hidden	Delete
2/7/2020 4:16 PM	TL50	Automated	TL50 has been Submitted. Producer: VDOT Testing Producer    Plant: JobMix: HMA_SC_202001    Lot Number: 202024    Sample Number: 3	<a href="#">Recall</a>	<input type="checkbox"/>	<input type="checkbox"/>
2/7/2020 12:53 PM	TL50	Automated	TL50 has been Submitted. Producer: VDOT Testing Producer    Plant: JobMix: HMA_SC_202001    Lot Number: 202003    Sample Number: 8	<a href="#">Recall</a>	<input type="checkbox"/>	<input type="checkbox"/>
2/7/2020 12:52 PM	TL50	Automated	TL50 has been Submitted. Producer: VDOT Testing Producer    Plant: JobMix: HMA_SC_202001    Lot Number: 202003    Sample Number: 7	<a href="#">Recall</a>	<input type="checkbox"/>	<input type="checkbox"/>
2/7/2020 12:52 PM	TL50	Automated	TL50 has been Submitted. Producer: VDOT Testing Producer    Plant: JobMix: HMA_SC_202001    Lot Number: 202003    Sample Number: 6	<a href="#">Recall</a>	<input type="checkbox"/>	<input type="checkbox"/>
2/7/2020 12:51 PM	TL50	Automated	TL50 has been Submitted. Producer: VDOT Testing Producer    Plant: JobMix: HMA_SC_202001    Lot Number: 202003    Sample Number: 5	<a href="#">Recall</a>	<input type="checkbox"/>	<input type="checkbox"/>
					<a href="#">Hide All</a>	<a href="#">Delete All</a>

[1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) ... [Last](#)

# MIT S MENU

## 1. Home

## 2. CMA Program

- Design
  - TL 127
  - Recall TL127
- Lots
  - Lot details
    - TL 52
    - Recall TL 52
    - Upload TL 52
  - Recall lot
- Projects
  - Project details
  - Recall Project
  - TL 102 QA list
    - TL 102 QA Details
    - Upload QA TL 102
  - TL 102 MA list
    - TL 102 MA Details

## • Reports

- Control Chart
- Investigation Report
- Point Adjustment
- Variability Analysis
- TL 127 job mix Formula
- TL 52 Monitor

## 3. HMA Program

## 4. Administration

- Security
  - User Management
- Design
  - Kind Type
  - Material Type
  - Aggregate Size Management
  - Sieve Management
  - CMA Specific

## • HMA Specific

## • Source Management

- District Management,
- Producer Management
- CMA Plant Management
- HMA Plant Management
- Communication
- Reports
- Security Audit
- All projects
- Producer
- Plant
- Yearly Summary

## 5. Help

- Online Manual
- Printable Manual
- Contact



# VDOT TL-127 FORM

- Job mix formula

Job-Mix Formula Materials (1 found)						
	Job Mix Phase	Kind		Source		
Edit	Materials	B %	Type	Size	Producer	Plant
<a href="#">Edit</a>	Aggregate	100 %	Limestone	#26	VDOT Testing Producer	Plant-Richmond
<a href="#">Add</a> <a href="#">Clear</a>	Select					

Job-Mix Formula Quality Control (6 found)							
Job-Mix Sieve		Job Mix Phase	Tolerance (+ or -)	Acceptance Range Average of (4) Test(s)		Design/Spec Range	
English	Metric	<u>Production</u> JMF B %		MIN B	MAX B	MIN	MAX
2in	50mm	100 %	0.0 %	100.0 %	100.0 %	100 %	
1in	25mm	85 %	5.0 %	80.0 %	90.0 %	94 %	100 %
3/8in	9.5mm	65 %	9.5 %	55.5 %	74.5 %	83 %	72 %
#10	2mm	35 %	7.0 %	28.0 %	42.0 %	32 %	41 %
#40	.425mm	15 %	4.0 %	11.0 %	19.0 %	14 %	24 %
#200	0.075mm	10.0 %	2.0 %	8.0 %	12.0 %	6 %	12 %
Values Displayed from 'Tolerance' to 'Design/Spec Range' are based on current reference tables.							

# VDOT TL-52 FORM

- Test report form of Individual CMA Sample
- Gradation, Atterberg limits, Water Content, and Cement content
- The producer shall provide the test results within 48 hours of sampling

**VDOT** Virginia Department of Transportation

**Producer Lab Analysis and Information Details**

Home > CMA Program > Lots > Lot Details > TL-52

Home CMA Program HMA Program Administration Help

**TL52 Aggregate Compliance Testing**

District: **NORTHERN VIRGINIA** Production Year: **2012**

Producer Name: **Fake Producer** Plant Name: **Plant Location**

Size Aggregate: **21A** Mix Type: **Aggregate Base Material-Type I**

Job Mix Number: **2012-13**

Lot Number: **6** Existing  New

Tonnage: **1500**

Project \ Schedule: **1234-56897-12345**

Locality: **Richmond** County  City  Town

Sample Date: **12/15/2012**

Sampled By: **Pete Lattimer**

Route: **Rte 66**

Sample Time: **1:00 PM**

VDOT Observer: **Select**

Date Received (VDOT): **04/16/2013**

VDOT Lab: **SALEM**

Tested By (Producer): **Claudia Donovan**

Tested By (VDOT): **Select**

Edit Producer Results

Gradation Atterberg Compaction

\*\*\* Tab Fields Detailed Separately \*\*\*

Producer Remarks:  
Any Relevant Remarks

VDOT Remarks:

Action History (0 found)		
Action	TimeStamp	User Name
District Administrator: Garrett Moore, P.E.		

Save TL52 Cancel Edit Calculate TL52 Submit TL52 Monitor Report

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# VDOT TL 52 FORM - Gradation

Job-Mix Formula Quality Control (16 found)															
Sieve		JMF	Producer results				VDOT results					D2S		Previous	
English	Metric		Weight Retained (g)	Percent Retained	Percent Passing	Percent Retained (-#10)	Percent Passing (-#10)	Weight Retained (g)	Percent Retained	Percent Passing	Percent Retained (-#10)	Percent Passing (-#10)	Percent Passing	F	T
3in	75mm		0.0	0.0 %	100 %			0.0 %	100 %			0.0 %	0.00	0.00	
2 1/2in	63mm		0.0	0.0 %	100 %			0.0 %	100 %			0.0 %	0.00	0.00	
2in	50mm	100 %	0.0	0.0 %	100 %			0.0 %	100 %			0.0 %	0.00	0.00	
1 1/2in	37.5mm		0.0	0.0 %	100 %			0.0 %	100 %			0.0 %	0.00	0.00	
1in	25mm	95 %	124.1	1.9 %	98 %		191.0	3.3 %	97 %			* 1.4 %	1.96	1.70	
3/4in	19mm		268.6	4.2 %	94 %		616.0	10.5 %	86 %			7.7 %	1.32	1.50	
1/2in	12.5mm		921.9	14.3 %	80 %		0.0	0.0 %	86 %			6.6 %	2.19	12.54	
3/8in	9.5mm	67 %	691.7	10.7 %	69 %		1543.0	26.3 %	60 %			* 9.0 %	1.98	0.00	
#4	4.75mm		1942.7	30.1 %	39 %		1035.0	17.6 %	42 %			3.5 %	2.02	0.64	
#10	2mm	24 %	1210.2	18.8 %	20 %		988.0	16.8 %	26 %			5.5 %	1.54	0.91	
Mechanical Analysis of #10 Sieve															
#20	0.85mm		89.30	8.6 %	11 %	42.9 %	57 %	44.30	8.7 %	17 %	34.3 %	66 %	5.4 %	1.49	4.35
#40	.425mm	11 %	34.90	3.4 %	8 %	16.8 %	40 %	20.80	4.1 %	13 %	16.1 %	50 %	* 4.7 %	1.25	3.77
#60	0.25mm		19.40	1.9 %	6 %	9.3 %	31 %	10.30	2.0 %	11 %	8.0 %	42 %	4.6 %	1.71	3.92
#80	0.18mm		7.30	0.7 %	5 %	3.5 %	28 %	4.70	0.9 %	10 %	3.6 %	38 %	4.4 %	2.09	5.66
#100	0.15mm		3.20	0.3 %	5 %	1.5 %	26 %	2.40	0.5 %	9 %	1.9 %	36 %	4.2 %	1.40	3.23
#200	0.075mm	7.0 %	1.10	0.1 %	5.0 %	0.5 %	25.5 %	6.90	1.4 %	7.9 %	5.3 %	30.9 %	2.9 %	1.70	3.72
Totals	(+#10)		5159.2					4373.0							

# D2S COMPARISON

- **D2S Tolerance Popup Panel**
- **D2S is the Individual Test differences between 2 results obtained on test portions of the same material.**
- **VDOT provides the maximum Acceptable Range of Two Test results called the d2s based on AASHTO test methods, Virginia test methods and historical data**
- **Highlighting Current Gradation Tolerance**

**CMA D2S Tolerance**

Gradation Acceptable Range (10 found)

Gradation Minimum Percent (>=)	Tolerance
95.0 %	1.0
85.0 %	3.9
80.0 %	5.4
60.0 %	8.0
20.0 %	5.6
15.0 %	4.5
<b>10.0 %</b>	<b>4.2</b>
5.0 %	3.4
2.0 %	3.0
0.0 %	1.3

Notes:

- In the event that for a given sieve, the total % of materials passing obtained by the producer and VDOT fall into different brackets, the acceptable range shall be that corresponding to the bracket designated by the job mix formula for the given sieve
- D2S uses gradation passing results to the tenth; which may be different than the precision used for the displayed passing result.
- D2S uses Atterberg limits results to the tenth; which may be different than the precision used for the displayed Atterberg limits result.

Sieve ID	JMF	Producer Passing	VDOT Passing	Tolerance
#40	11.0 %	8.0 %	12.7 %	4.2

# VDOT TL 52 FORM – Atterberg limits

Notes :

- In the event that for a given sieve, the total % of materials passing obtained by the producer and VDOT fall into different brackets, the acceptable ranges shall be that corresponding to the bracket designated by the job mix formula for the given sieve
- D2S uses gradation passing results to the tenth; which may be different than the precision used for the displayed passing result.
- D2S uses Atterberg limits results to the tenth; which may be different than the precision used for the displayed Atterberg limits result.

Field	JMF	Producer	VDOT	D2S Difference	D2S Tolerance
Liquid Limit	23 %	14.9 %	13.5 %	1.4 %	1.8 %
Plastic Limit		0.0 %	0.0 %	0.0 %	0.0 %

% Cement Tolerance:

A factor to calculate Liquid Limit D2S, % of Mean:

A factor to calculate Plastic Limit D2S, % of Mean:

D2S Diff.	D2S Tol.	Criteria Max	Previous	
			F	T
0 %	0.0 %			
		2.0 %	0.00	0.00

# CONTROL CHARTS

- Required by the Spec
- Created for spec sieves, LL, PI, and Cement Content (if applicable)

Control Sieve 9.5mm (3/8in)

Control Sieve 2mm (#10)

Control Sieve .425mm (#40)

CONTROL GUIDES

Control Sieve 0.075mm (#200)

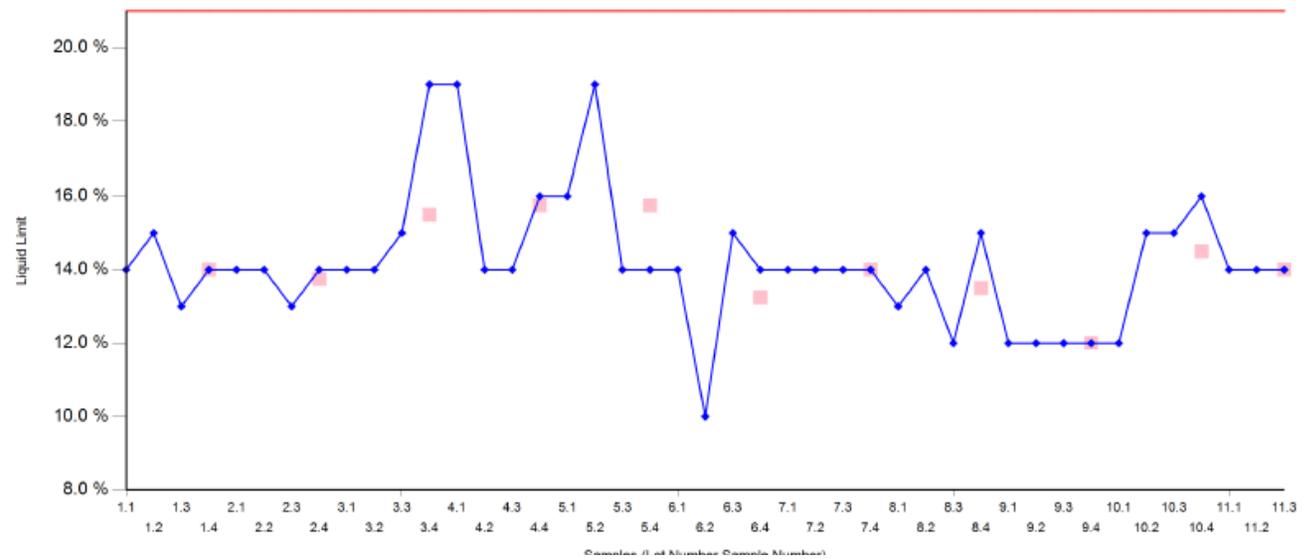
CONTROL GUIDES

Liquid Limit

WAR#  
 (1  
 12 WAI  
 \* (2  
 BE  
 (3  
 PT  
 JC

WAR#  
 (1  
 S  
 (2  
 B  
 (3  
 P  
 J

WARNING  
 (1) 1 P  
 2.66%  
 \* (2) 3 C  
 BEYON  
 (3) 11 C  
 PTS. O  
 JOB M



# CONTROL CHARTS

- **Established the following control limits to Provides warnings**
  - **Number 1 Warning Limit:  $\pm 2$  standard deviations from job mix**
    - Will show warning when one test result is outside this limit
  - **Number 2 Warning Limit:  $\pm 1$  standard deviation from job mix**
    - Will show warning when 3 consecutive test results are outside this limit
  - **Will also show Warning when 11 consecutive test results fall on the same side of the job-mix.**

# CONTROL CHARTS

Virginia Department of Transportation  
NORTHERN VIRGINIA Materials Division  
Control Chart Report

Prod Year: 2014 Contractor: \_\_\_\_\_ Plant Location: Manassas  
Job Mix D: \_\_\_\_\_ Design Type: Subbase and Aggregate base Mix Type: Aggregate Base Material-Type I Size: 21A

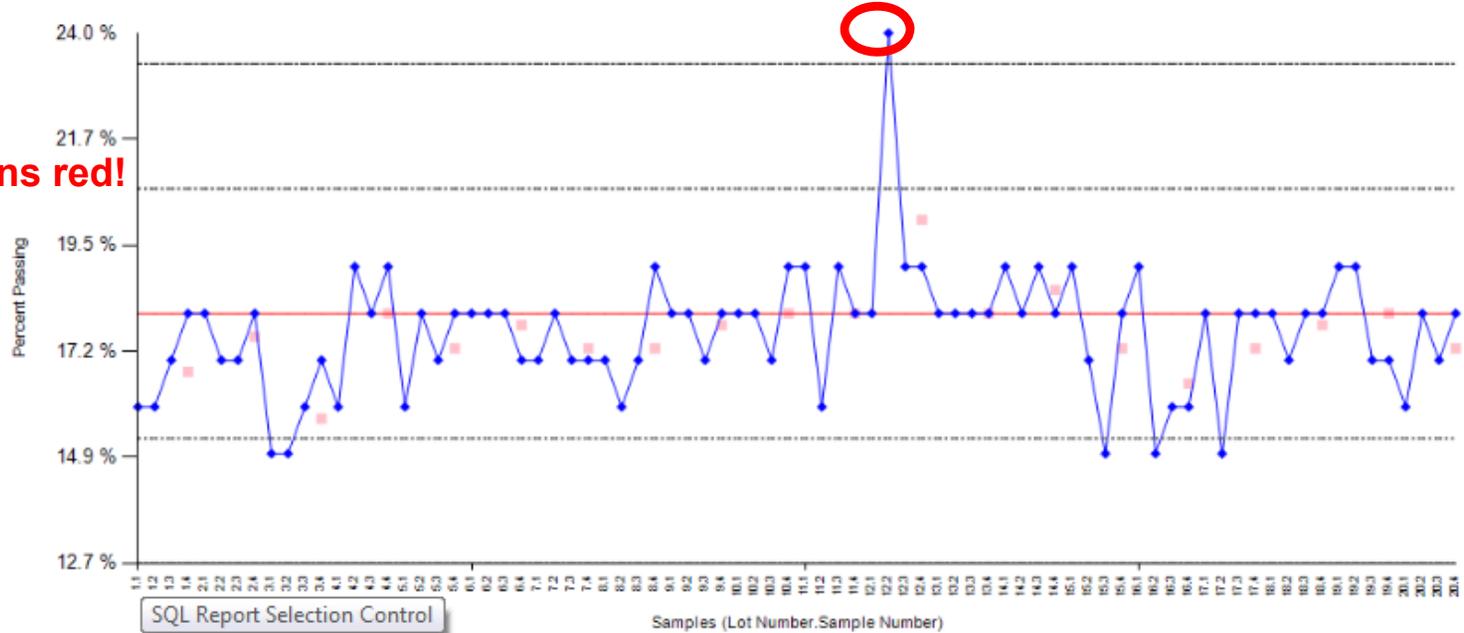
## Control Sieve .425mm (#40)

### CONTROL GUIDES

#### WARNING SIGNALS

- (1) 1 PT. BEYOND  $\pm 5.34\%$
- (2) 3 CONSECUTIVE PTS. BEYOND  $\pm 2.67\%$
- (3) 11 CONSECUTIVE PTS. ON SAME SIDE OF JOB MIX

Turns red!



SQL Report Selection Control

■ Lot Average — Target □ WL1 □ WL2 — Percent Passing

# MATCHED AND NON-MATCHED COMPARISONS

**VDOT uses contractor quality control test results for acceptance of CMA and HMA**

**23 CFR 637.207 (2) : Quality control sampling and testing results may be used as part of the acceptance decision provided that:**

**(A) The sampling and testing has been performed by qualified laboratories and qualified sampling and testing personnel. – training and certification program and system of laboratory inspection**

**(B) The quality of the material has been validated by the verification testing and sampling. The verification sampling shall be performed on samples that are taken independently of the quality control samples.**

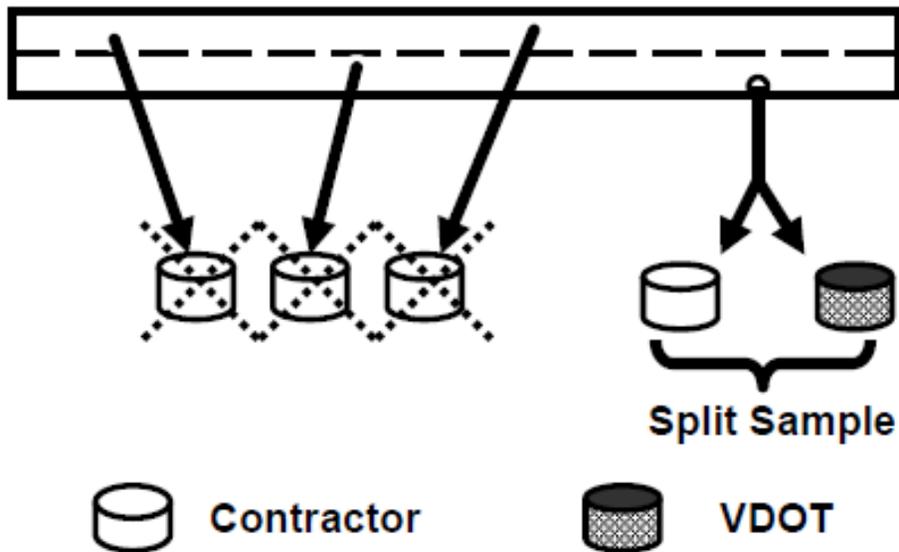
**(C) The quality control sampling and testing is evaluated by an Independent Assurance (IA) program.**

**→ (B) and (C) are evaluated by split samples using a statistical method**

**→ Statistical calculations are defined in VTM-59**

# VTM-59 : Matched Comparison Analysis

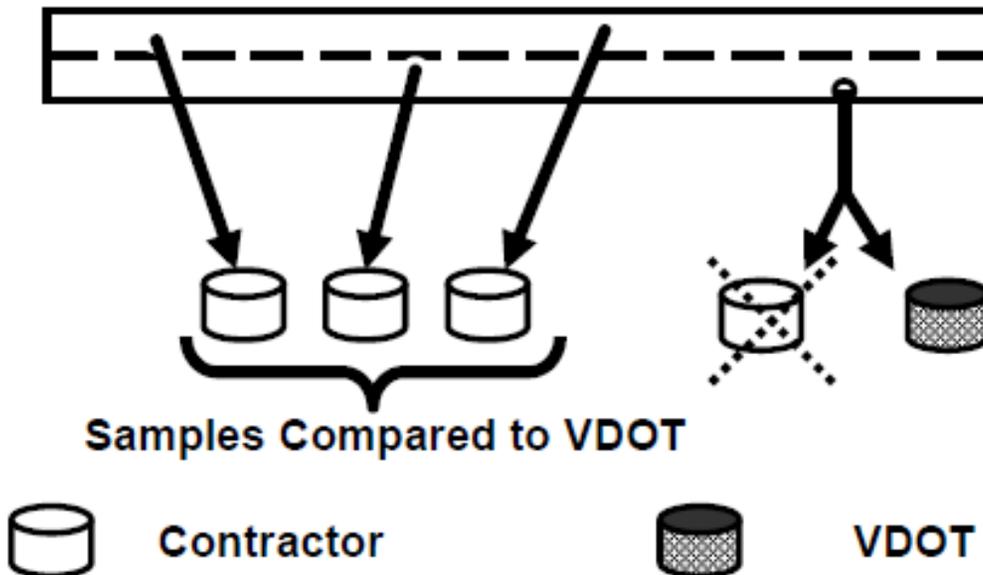
- Comparison is made using the Split samples only
- Independent Assurance (IA) Testing



- **Paired t-test:** If calculated  $t \geq t_{\alpha/2, n-\alpha}$  then VDOT average  $\neq$  the contractor's average
- **F-test :** If calculated  $F \geq F_{.99}$  then VDOT standard deviation  $\neq$  the contractor's variability

# VTM-59 : Non-Matched Comparison Analysis

- VDOT split samples vs the Producer Non-split samples
- Verification (VST) Testing



- **T-test:** If calculated  $|AM-AC| \geq \mu$ , then VDOT average  $\neq$  the contractor's average
- **F-test :** If calculated  $F \geq F_{.99}$  then VDOT standard deviation  $\neq$  the contractor's variability

# Matched Comparison Analysis Report

Virginia Department of Transportation  
Materials Division  
CENTRAL-MIX AGGREGATE  
Matched Comparison Analysis Report (IA)

Producer: \_\_\_\_\_ Plant: \_\_\_\_\_ Job Mix ID: -2014-01 Mix Type: Aggregate Base Material-Type I Size: 21A

**Producer Plant Data**

Lot Number	Sample Number	Sample Date	3in (75mm)	2 1/2in (63mm)	2in (50mm)	1 1/2in (37.5mm)	1in (25mm)	3/4in (19mm)	1/2in (12.5mm)	3/8in (9.5mm)	#4 (4.75mm)	#10 (2mm)	#20 (0.85mm)	#40 (.425mm)	#60 (0.25mm)	#80 (0.18mm)	#100 (0.15mm)
1	3	1/9/2019	100 %	100 %	100 %	100 %	100 %	97 %	79 %	71 %	51 %	36 %	26 %	22 %	19 %	16 %	15 %
2	4	2/8/2019	100 %	100 %	100 %	100 %	100 %	98 %	82 %	72 %	53 %	38 %	26 %	22 %	19 %	17 %	16 %
4	4	6/21/2019	100 %	100 %	100 %	100 %	100 %	98 %	80 %	69 %	50 %	37 %	29 %	24 %	20 %	18 %	16 %
5	2	7/18/2019	100 %	100 %	100 %	100 %	100 %	99 %	85 %	71 %	49 %	35 %	26 %	22 %	19 %	17 %	15 %
<b>Current JMF</b>					100 %		95 %			69 %		35 %		22 %			
<b>Mean</b>			100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	98.0 %	81.5 %	70.8 %	50.8 %	36.5 %	26.8 %	22.5 %	19.3 %	17.0 %	15.5 %
<b>Standard Deviation</b>			0.0	0.0	0.0	0.0	0.0	0.8	2.6	1.3	1.7	1.3	1.5	1.0	0.5	0.8	0.6

**VDOT Monitor Data**

Lot Number	Sample Number	Sample Date	3in (75mm)	2 1/2in (63mm)	2in (50mm)	1 1/2in (37.5mm)	1in (25mm)	3/4in (19mm)	1/2in (12.5mm)	3/8in (9.5mm)	#4 (4.75mm)	#10 (2mm)	#20 (0.85mm)	#40 (.425mm)	#60 (0.25mm)	#80 (0.18mm)	#100 (0.15mm)
1	3	1/9/2019	100 %	100 %	100 %	100 %	100 %	96 %	96 %	71 %	51 %	36 %	26 %	21 %	18 %	16 %	15 %
2	4	2/8/2019	100 %	100 %	100 %	100 %	100 %	96 %	96 %	74 %	54 %	37 %	27 %	22 %	19 %	17 %	16 %
4	4	6/21/2019	100 %	100 %	100 %	100 %	100 %	96 %	96 %	69 %	50 %	36 %	26 %	22 %	18 %	16 %	15 %
5	2	7/18/2019	100 %	100 %	100 %	100 %	100 %	97 %	97 %	69 %	47 %	32 %	23 %	19 %	17 %	15 %	14 %
<b>Current JMF</b>					100 %		95 %			69 %		35 %		22 %			
<b>Mean</b>			100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	96.2 %	96.2 %	70.7 %	50.5 %	35.3 %	25.5 %	21.0 %	18.0 %	16.0 %	15.0 %
<b>Standard Deviation</b>			0.0	0.0	0.0	0.0	0.0	0.5	0.5	2.4	2.9	2.2	1.7	1.4	0.8	0.8	0.8

**Paired T - Differences**

Lot Number	Sample Number	Sample Date	3in (75mm)	2 1/2in (63mm)	2in (50mm)	1 1/2in (37.5mm)	1in (25mm)	3/4in (19mm)	1/2in (12.5mm)	3/8in (9.5mm)	#4 (4.75mm)	#10 (2mm)	#20 (0.85mm)	#40 (.425mm)	#60 (0.25mm)	#80 (0.18mm)	#100 (0.15mm)
1	3	1/9/2019	0 %	0 %	0 %	0 %	0 %	1 %	-17 %	0 %	0 %	0 %	0 %	1 %	1 %	0 %	0 %



# Non-Matched Comparison Analysis Report

## Non-Matched Comparison Analysis Report (QA)

Producer: \_\_\_\_\_ Plant: \_\_\_\_\_ Job Mix ID: 2014-01 Mix Type: Aggregate Base Material-Type I Size: 21A

### Producer Plant Data

Lot Number	Sample Number	Sample Date	3in (75mm)	2 1/2in (63mm)	2in (50mm)	1 1/2in (37.5mm)	1in (25mm)	3/4in (19mm)	1/2in (12.5mm)	3/8in (9.5mm)	#4 (4.75mm)	#10 (2mm)	#20 (0.85mm)	#40 (.425mm)	#60 (0.25mm)	#80 (0.18mm)	#100 (0.15mm)	#200 (0.075mm)	Liquid Limit
1	1	1/2/2019	100 %	100 %	100 %	100 %	100 %	96 %	80 %	70 %	51 %	36 %	25 %	21 %	18 %	16 %	15 %	10.3 %	0 %
	2	1/7/2019	100 %	100 %	100 %	100 %	100 %	96 %	79 %	69 %	49 %	34 %	24 %	20 %	17 %	15 %	14 %	9.4 %	0 %
	4	1/21/2019	100 %	100 %	100 %	100 %	100 %	96 %	78 %	68 %	49 %	34 %	25 %	21 %	18 %	16 %	15 %	9.8 %	0 %
2	1	1/29/2019	100 %	100 %	100 %	100 %	100 %	95 %	79 %	69 %	51 %	37 %	27 %	22 %	19 %	17 %	16 %	9.8 %	0 %
	2	2/1/2019	100 %	100 %	100 %	100 %	100 %	96 %	81 %	71 %	51 %	37 %	24 %	19 %	16 %	14 %	13 %	8.9 %	0 %
	3	2/7/2019	100 %	100 %	100 %	100 %	100 %	96 %	81 %	72 %	53 %	38 %	25 %	21 %	18 %	16 %	15 %	9.8 %	0 %
4	1	5/14/2019	100 %	100 %	100 %	100 %	100 %	95 %	81 %	71 %	52 %	38 %	29 %	23 %	20 %	18 %	16 %	10.8 %	0 %
	2	5/15/2019	100 %	100 %	100 %	100 %	100 %	97 %	84 %	75 %	55 %	40 %	30 %	25 %	22 %	19 %	18 %	11.8 %	0 %
	3	6/18/2019	100 %	100 %	100 %	100 %	100 %	99 %	82 %	73 %	55 %	40 %	28 %	23 %	19 %	17 %	16 %	11.0 %	0 %
5	1	6/21/2019	100 %	100 %	100 %	100 %	100 %	97 %	80 %	71 %	52 %	38 %	27 %	23 %	20 %	18 %	17 %	10.5 %	0 %
6	1	9/12/2019	100 %	100 %	100 %	100 %	100 %	96 %	81 %	72 %	53 %	39 %	29 %	25 %	21 %	19 %	17 %	10.8 %	0 %
	2	9/24/2019	100 %	100 %	100 %	100 %	100 %	97 %	79 %	68 %	47 %	34 %	25 %	21 %	18 %	16 %	15 %	10.1 %	0 %
	3	12/12/2019	100 %	100 %	100 %	100 %	100 %	96 %	78 %	67 %	48 %	36 %	27 %	22 %	19 %	17 %	15 %	9.9 %	0 %
	4	12/13/2019	100 %	100 %	100 %	100 %	100 %	97 %	81 %	70 %	51 %	36 %	27 %	22 %	19 %	17 %	15 %	9.9 %	0 %
Current JMF					100 %		95 %			69 %		35 %		22 %				10.0 %	23 %
Mean			100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	96.4 %	80.3 %	70.4 %	51.2 %	36.9 %	26.6 %	22.0 %	18.9 %	16.8 %	15.5 %	10.2 %	0.0 %
Standard Deviation			0.0	0.0	0.0	0.0	0.0	1.0	1.6	2.2	2.4	2.1	2.0	1.7	1.6	1.4	1.3	0.7	0.0

### VDOT Monitor Data

- If there is a statistical significant difference between the two sets of results, an investigation will be made to determine the reason for the difference.

5	2	1/18/2019	100 %	100 %	100 %	100 %	100 %	97 %	97 %	69 %	47 %	32 %	23 %	19 %	17 %	15 %	14 %	10.0 %	0 %
Current JMF					100 %		95 %			69 %		35 %		22 %				10.0 %	23 %



# INVESTIGATION FORM

- Investigative activities, findings, corrective actions, and final resolution

Inside VDOT Materials Business Center Materials

**VDOT** Materials Information Tracking System  
Virginia Department of Transportation

Home > CMA Program > Investigations > Investigation Details

Home CMA Program > HMA Program > Administration > Help >

### CMA Investigation Details

District:  Production Year:

Investigation Number:  Investigation Title:

Investigation Type:  IA  VST  Other Investigation Status:  Completed

Producer Name:  Plant Name:

Job Mix Number:

Properties:

3in (75mm)     2 1/2in (63mm)     2in (50mm)     1 1/2in (37.5mm)     1in (25mm)     3/4in (19mm)  
 1/2in (12.5mm)     3/8in (9.5mm)     #4 (4.75mm)     #10 (2mm)     #20 (0.85mm)     #40 (.425mm)  
 #80 (0.25mm)     #80 (0.18mm)     #100 (0.15mm)     #200 (0.075mm)     Cement     Liquid Limit  
 Plasticity Index     Moisture Content     Plastic Limit

Detail Description:

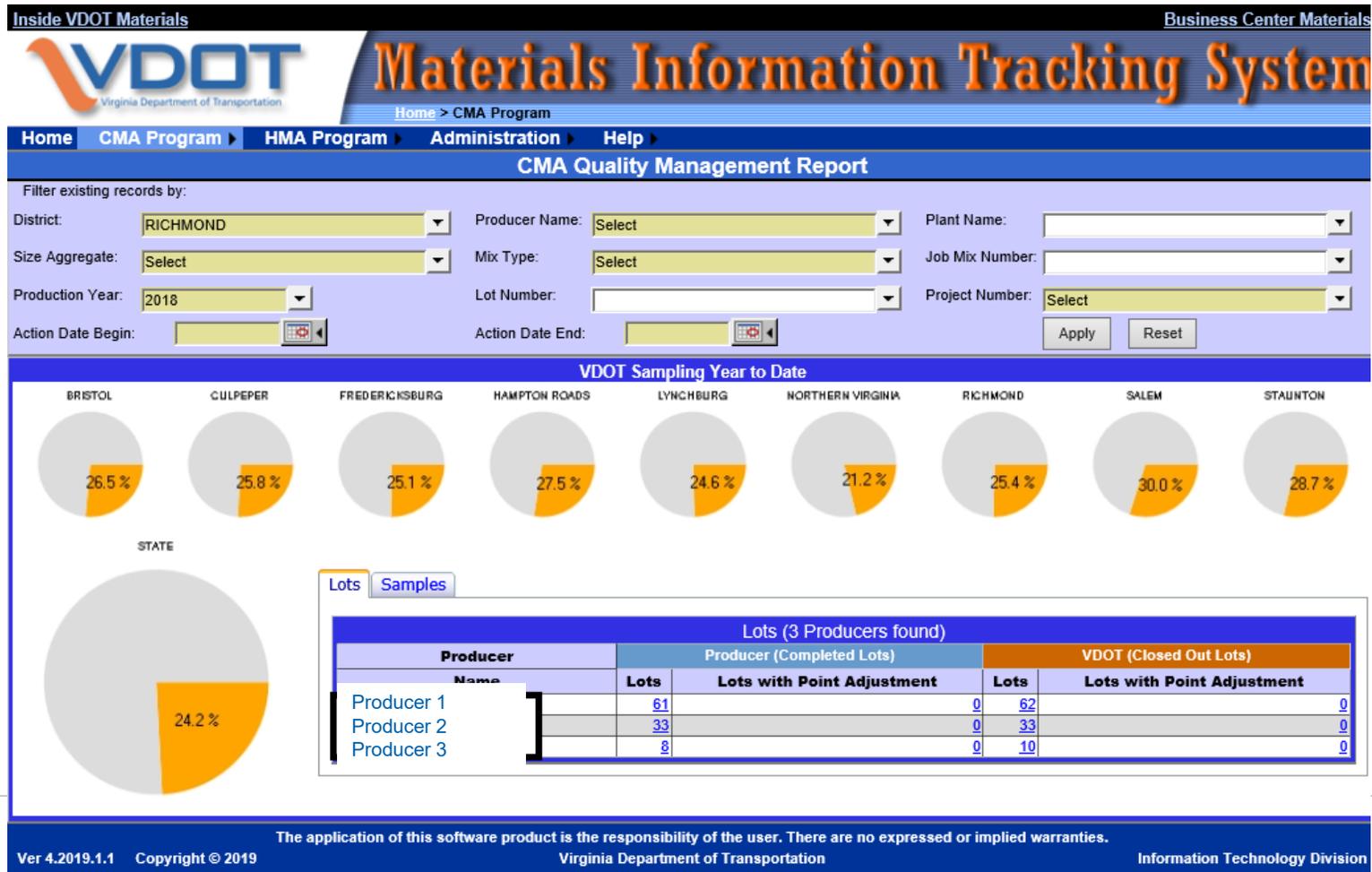
Diary Entries (0 found)

Edit	Created TimeStamp	Created By	Entry
<a href="#">Add</a> <a href="#">Clear</a>			

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# Quality Management Report – Level 1



# Quality Management Report – Level 1

Inside VDOT Materials
Business Center Materials

## Materials Information Tracking System

Home > CMA Program

Home | 
 CMA Program | 
 HMA Program | 
 Administration | 
 Help

### CMA Quality Management Report

Filter existing records by:

District: <input type="text" value="RICHMOND"/>	Producer Name: <input type="text" value="Select"/>	Plant Name: <input type="text"/>	
Size Aggregate: <input type="text" value="Select"/>	Mix Type: <input type="text" value="Select"/>	Job Mix Number: <input type="text"/>	
Production Year: <input type="text" value="2018"/>	Lot Number: <input type="text"/>	Project Number: <input type="text" value="Select"/>	
Action Date Begin: <input type="text"/>	Action Date End: <input type="text"/>	<input type="button" value="Apply"/>	<input type="button" value="Reset"/>

#### VDOT Sampling Year to Date

BRISTOL	CULPEPER	FREDERICKSBURG	HAMPTON ROADS	LYNCHBURG	NORTHERN VIRGINIA	RICHMOND	SALEM	STAUNTON

STATE

[Lots](#) | [Samples](#)

TL52 Samples (3 Producers found)								
Producer Name	Producer			VDOT				
	Submitted Samples	Grad/Cement Flags	Atterberg Limits Flags	Released Samples	Grad/Cement Flags	Atterberg Limits Flags	Grad/Cement D2S Flags	Atterberg Limits D2S Flags
Producer 1	242	10	0	58	9	0	12	23
Producer 2	123	16	0	28	4	0	7	0
Producer 3	25	2	0	5	0	0	4	0

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# Quality Management Report – Level 2

Inside VDOT Materials
Business Center Materials



## Materials Information Tracking System

Home > CMA Program

Home CMA Program HMA Program Administration Help

### CMA Quality Management Report

[Return To Level 1](#)

**Jobmix Search Results (2 found)**

Select	District	Producer	Plant	Size Aggregate	Mix Type	Job Mix ID	IA %	Reports	
<a href="#">Select</a>	RICHMOND	Producer 1	Plt 1	21B	Aggregate Base Material-Type I	JMF 1	100.0 %	<input type="button" value="Matched"/>	<input type="button" value="NonMatched"/>
								<input type="button" value="Random"/>	<input type="button" value="ControlChart"/>
<a href="#">Select</a>	RICHMOND	Producer 2	Plt 2	21B	Aggregate Base Material-Type I	JMF 2	18.5 %	<input type="button" value="Matched"/>	<input type="button" value="NonMatched"/>
								<input type="button" value="Random"/>	<input type="button" value="ControlChart"/>

Lots

Samples

**Sample Search Results (2 found)**

Lot	Sample Number	Tonnage	Sampled Date/Time	Current Status	Producer			VDOT					
					Grad	Grad/Cement Flags	Atterberg Limits Flags	Grad	Grad/Cement Flags	Grad/Cement D2S Flags	Atterberg Limits Flags	Atterberg Limits D2S Flags	
<a href="#">3</a>	3	1454	2/7/2019 1:44 PM	Released	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	#10				
<a href="#">6</a>	2	616	3/7/2019 11:08 AM	Released	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	#200				

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# AUTOMATIC NOTIFICATIONS

## Options for automatic Notifications:

- **3 consecutive flags on the results of gradation (the same sieve) and Atterberg limits for the producer samples**
- **2 consecutive D2S flags on the gradation (the same sieve) and Atterberg limits**
- **Atterberg Limits failure**
- **Cement Content failure**
- **Matched and Non- Matched Comparisons – on the first flag**
- **Notification when contractor submits data outside the 48 hour window**
- **Warning signals on control chart**
- **Monthly Sampling rate if percentage is below 20%**

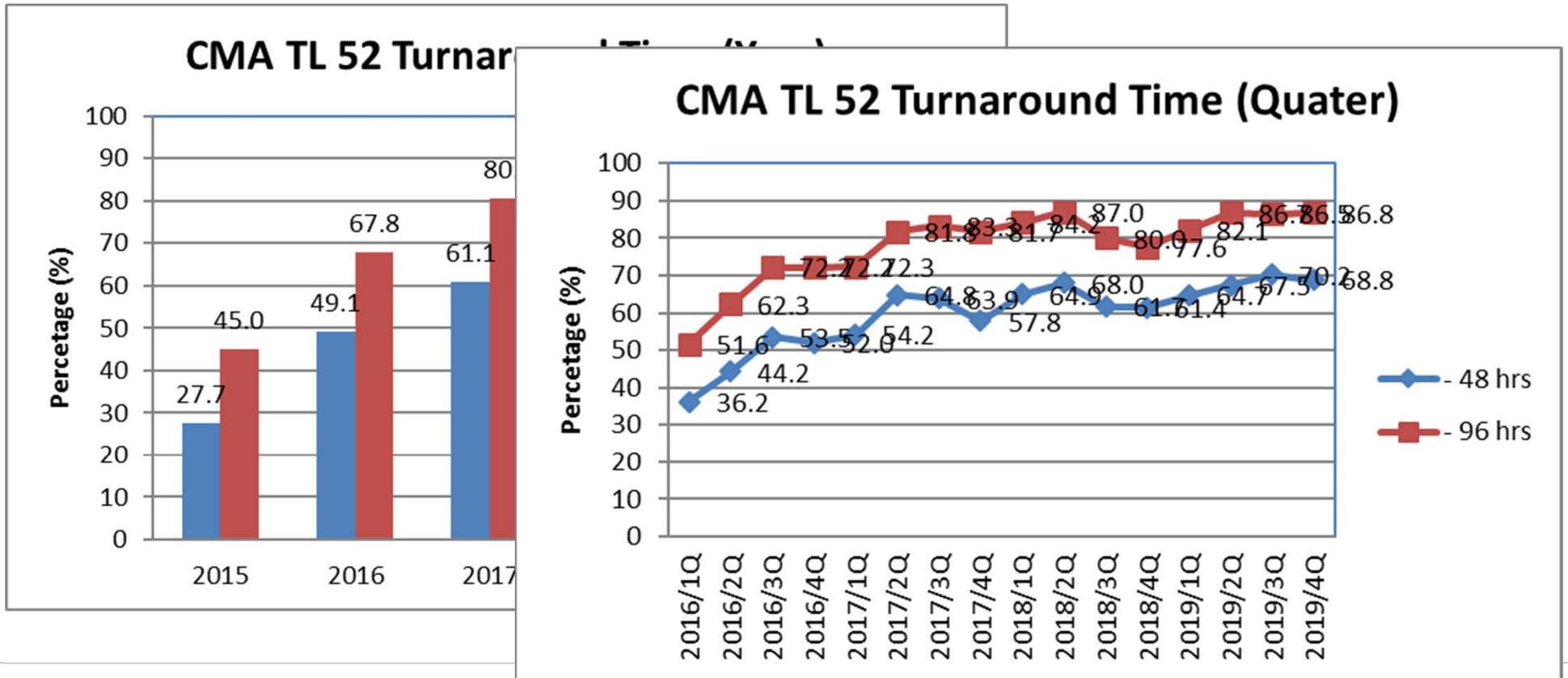
# NOTIFICATIONS

- Can select the option of receiving notification (No / Email or System)

CMA	Atterberg Limits failure: if the liquid limit exceeds 30 or the plasticity index exceeds 6 for Type I base material or No. 19 subbase materials; or the plasticity index exceeds 9 for Type II base material size 21, 21A, 21B, or 22, or Select Materials Type I on any individual VDOT sample.	<input type="radio"/> No	<input type="radio"/> Email	<input checked="" type="radio"/> System
CMA	Cement Content failure: if any individual producer sample has cement content more than 1.6 percent below the design cement content.	<input type="radio"/> No	<input type="radio"/> Email	<input checked="" type="radio"/> System
CMA	Cement Content failure: if any individual VDOT sample with cement content more than 1.6 percent below the design cement content.	<input type="radio"/> No	<input type="radio"/> Email	<input checked="" type="radio"/> System
CMA	Matched and Non-Matched Comparison Flags	<input type="radio"/> No	<input type="radio"/> Email	<input checked="" type="radio"/> System
CMA	Notification when contractor submits data outside the 48 hour window.	<input type="radio"/> No	<input type="radio"/> Email	<input checked="" type="radio"/> System
CMA	Warning signals on control chart.	<input type="radio"/> No	<input type="radio"/> Email	<input checked="" type="radio"/> System
CMA	Monthly Sampling rate if percentage is below 20%	<input type="radio"/> No	<input type="radio"/> Email	<input checked="" type="radio"/> System
CMA	TL102 Submission.	<input type="radio"/> No	<input type="radio"/> Email	<input checked="" type="radio"/> System

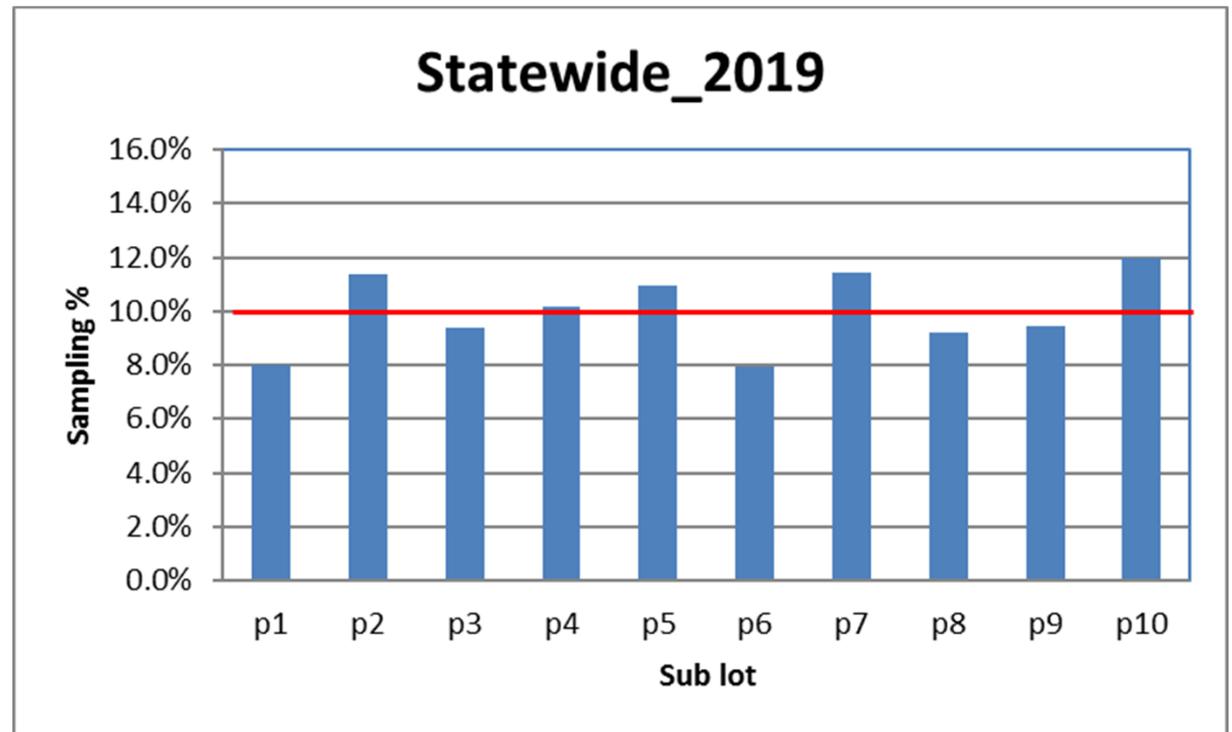
# DATA ANALYSIS

- Sample Turnaround time

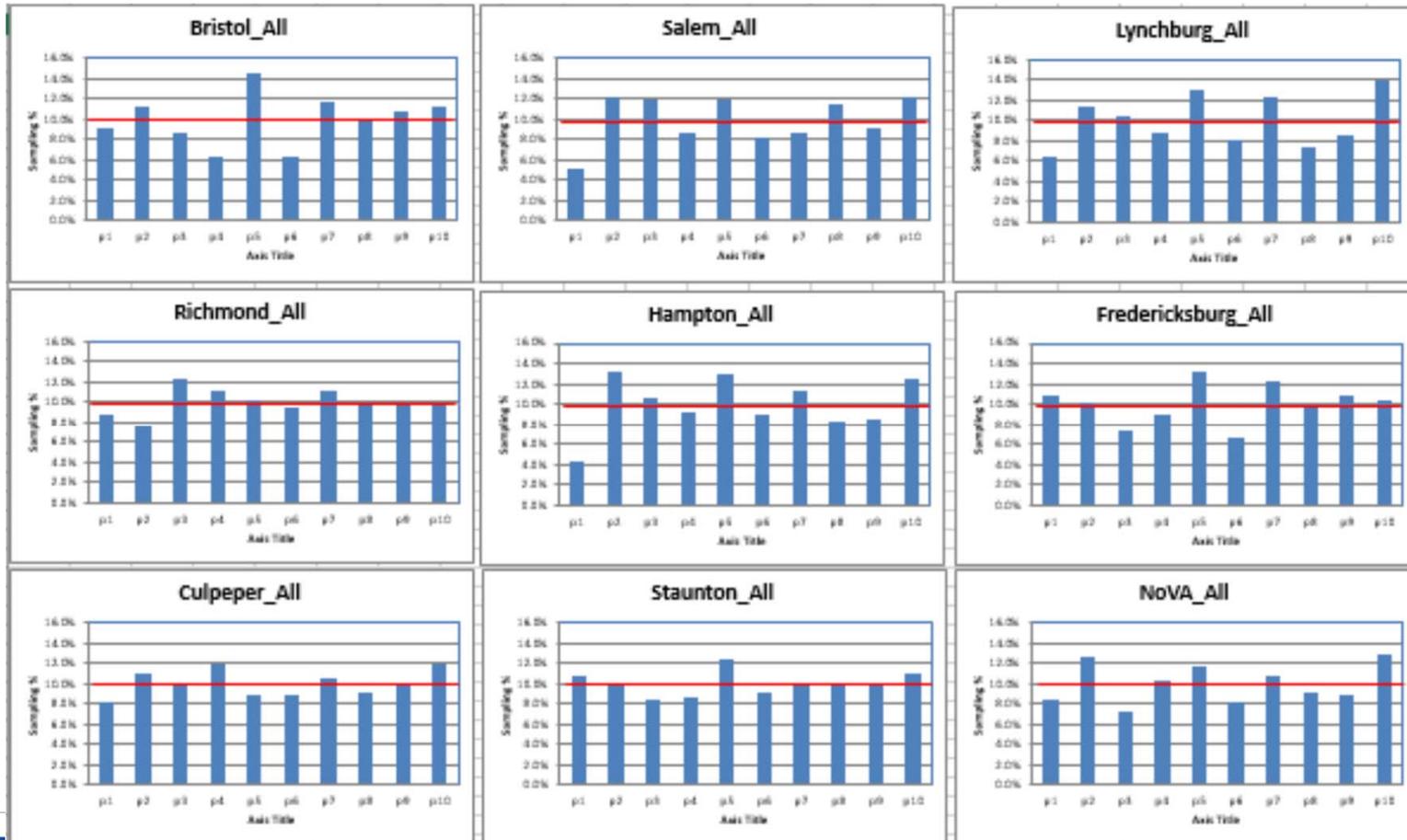


# DATA ANALYSIS

- **Random Sampling %**
  - Sampling % for each sub-lot should be close to 10% if randomly sampled
  - The lower standard deviation is, the more likely samples were taken randomly



# Random Sampling Percentage



Thank you!

