

2022 PAPA Regional Technical Meeting

2021 PennDOT LTS Review

2021 Summary of Lot Payments (LTS and HOLA Lots)

Categories:

- Wearing & Binder Courses (Old 409, New 413)
 - Standard (409A, 409APWL, 413STDPWL)
 - RPS (409B, 409BPWL, 413RPSPWL)
- Base Course
 - Standard (409A, 409APWL, 413STDPWL)
- SMA (419)

2021 Summary of Lot Payments (LTS and HOLA Lots)

Includes:

Laboratory Testing Section (LTS) Data

- Includes Partial Lot Payments (n=1 or n=2)
- Does not include lots that have District Special Provisions (DSP)

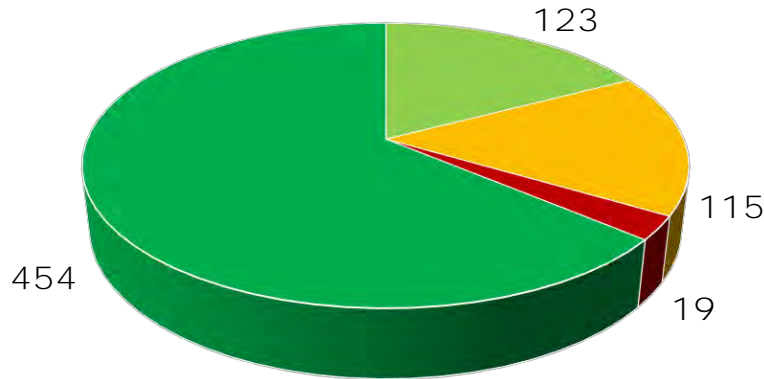
Asphalt Local Acceptance (ALA) Data

- Entered in eCAMMS and includes lot payment
- Includes Partial Lot Payments (n=1 or n=2)
- Does not include lots that have District Special Provisions (DSP)

2021 Statewide Lot Payment Standard Wearing and Binder Courses

Standard Lots Wearing & Binder

- Full Payment
- Reduced Payment
- Remove & Replace/50% Pay
- Bonus Pay

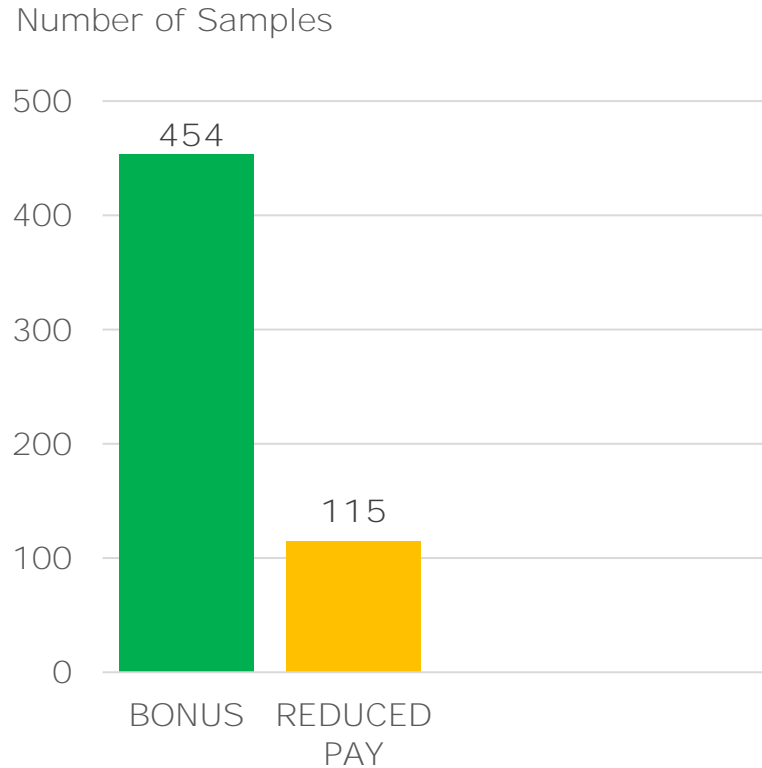


Total = 711 Samples

Bonus Payment	63.8%
Full Payment	17.3%
Reduced Payment	16.2%
Defective - R&R/50%	2.7%

Lots	Total	AC	No.200	Density
Defective	19	5	2	12

Bonus vs. Reduced Pay Standard Wearing and Binder

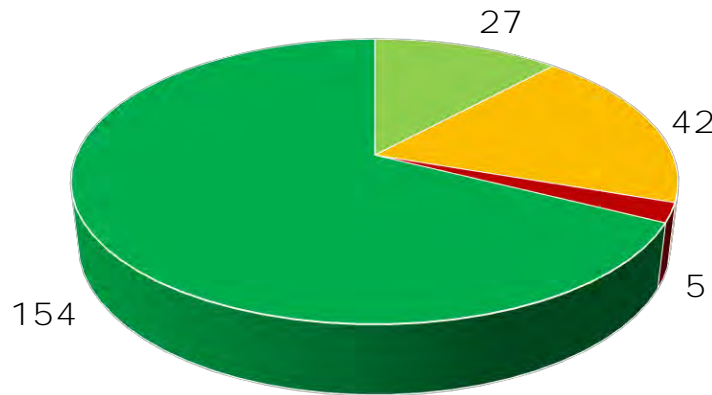


Pay Factor	No. of Samples	TOTAL
83%	2	115
84%	1	
86%	1	
87%	1	
88%	2	
89%	3	
90%	7	
91%	3	
92%	7	
93%	3	
94%	11	
95%	5	
96%	9	
97%	20	
98%	14	
99%	26	
100%	123	454
101%	52	
102%	169	
103%	59	
104%	174	

2021 Statewide Lot Payment RPS Wearing and Binder Courses

RPS Lots Wearing & Binder

- Full Payment
- Reduced Payment
- Remove & Replace/50% Pay
- Bonus Pay



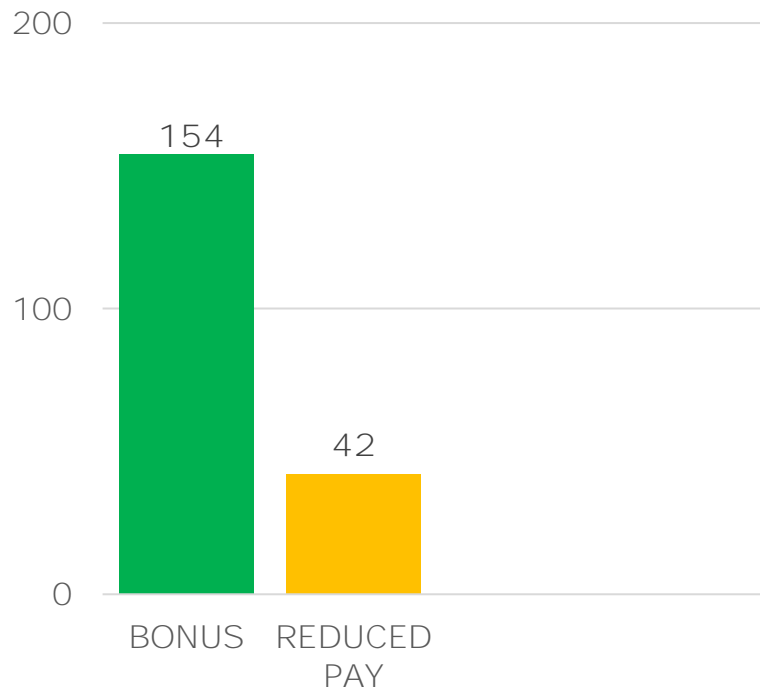
Total = 228 Samples

Bonus Payment	67.3%
Full Payment	11.8%
Reduced Payment	18.3%
Defective – R&R/50%	2.6%

Lots	Total	AC	No.200	Density
Defective	5	2	1	2

Bonus vs. Reduced Pay RPS Wearing and Binder

Number of Samples

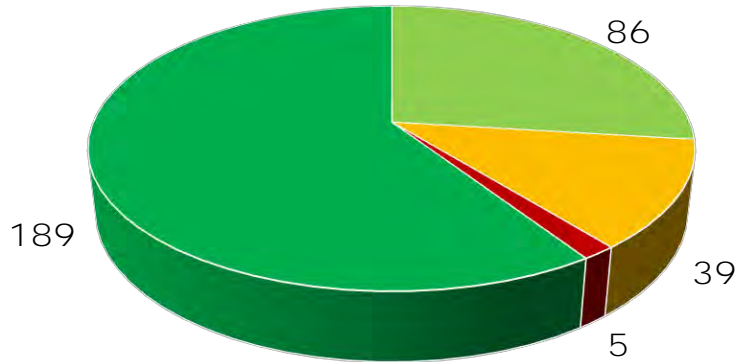


Pay Factor	No. of Samples	TOTAL
81%	1	42
85%	1	
88%	3	
89%	3	
90%	5	
91%	2	
92%	2	
93%	2	
94%	3	
95%	3	
96%	1	
97%	4	
98%	5	
99%	7	
100%	27	154
101%	21	
102%	24	
103%	23	
104%	86	

2021 Statewide Lot Payment Standard Base Courses

Standard Lots Base Course

- Full Payment
- Reduced Payment
- Remove & Replace/50% Pay
- Bonus Pay



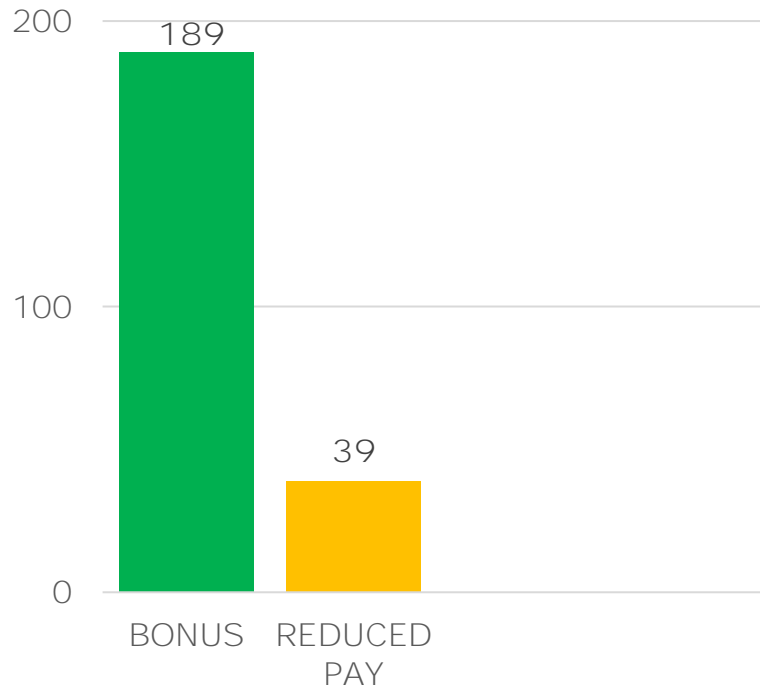
Total = 319 Samples

Bonus Payment	59.2%
Full Payment	27.0%
Reduced Payment	12.2%
Defective - R&R/50%	1.6%

Lots	Total	AC	No.200	Density
Defective	5	2	3	0

Bonus vs. Reduced Pay Standard Base Course

Number of Samples

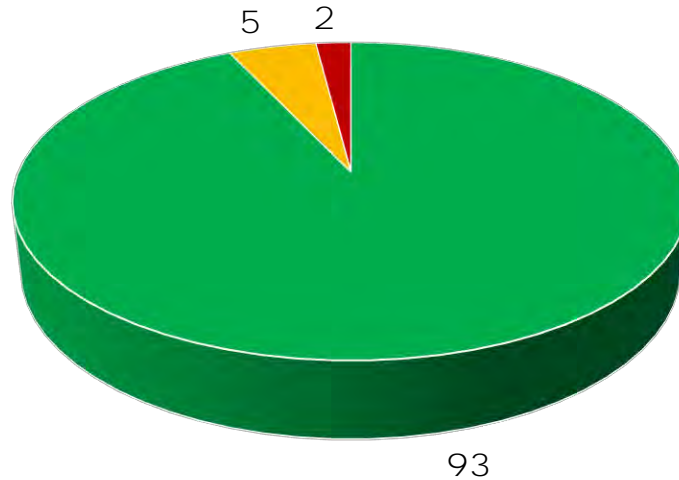


Pay Factor	No. of Samples	TOTAL
91%	2	39
93%	1	
94%	4	
95%	5	
96%	5	
97%	5	
98%	10	
99%	7	189
100%	86	
101%	14	
102%	39	
103%	28	
104%	108	

2021 Statewide Lot Payment SMA Wearing Courses

SMA Wearing Course

■ Full Payment ■ Reduced Payment ■ Remove & Replace/50% Pay

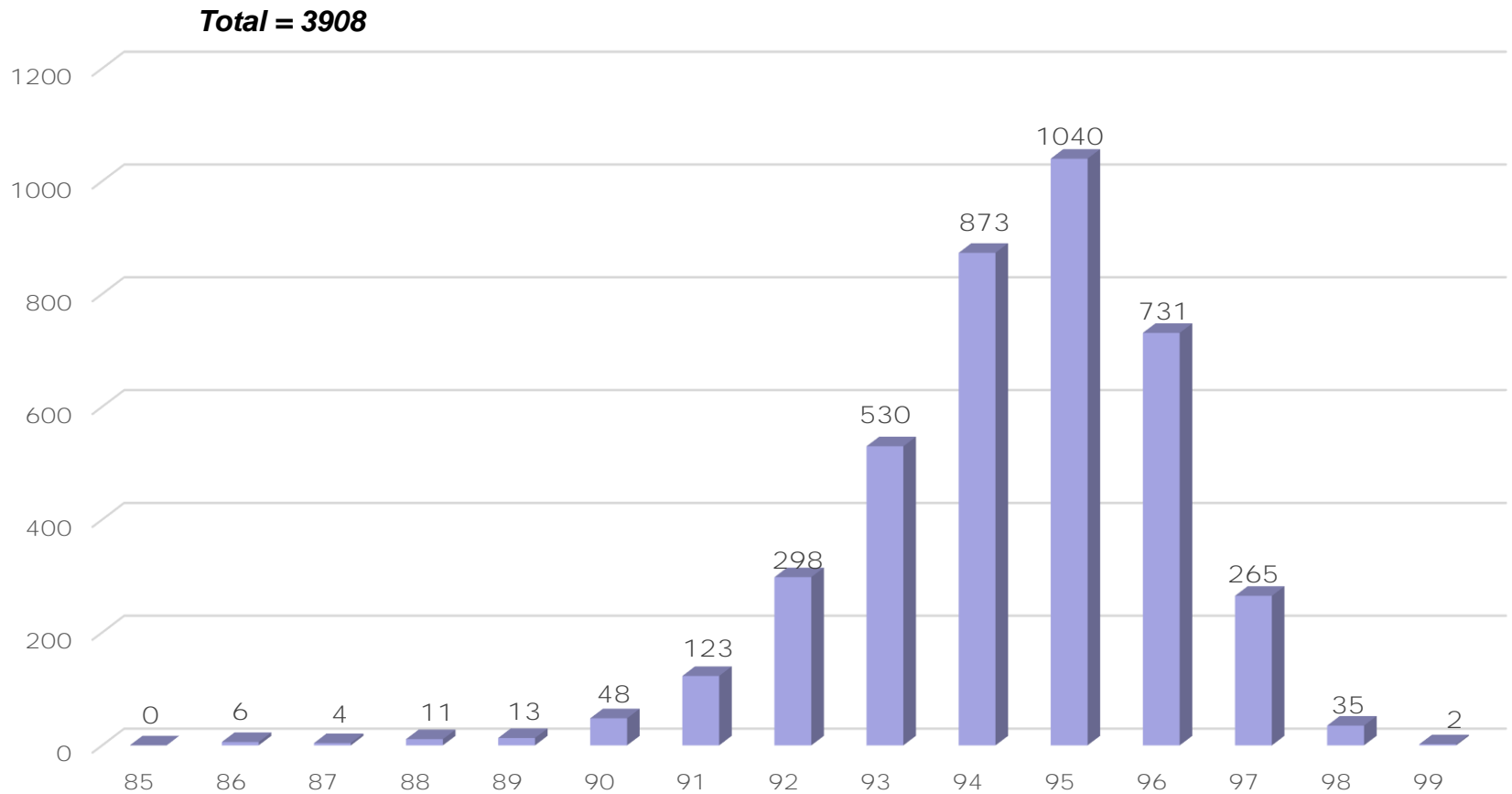


Total = 100 Samples

Full Payment	93.0%
Reduced Payment	5.0%
Defective – R&R/50%	2.0%

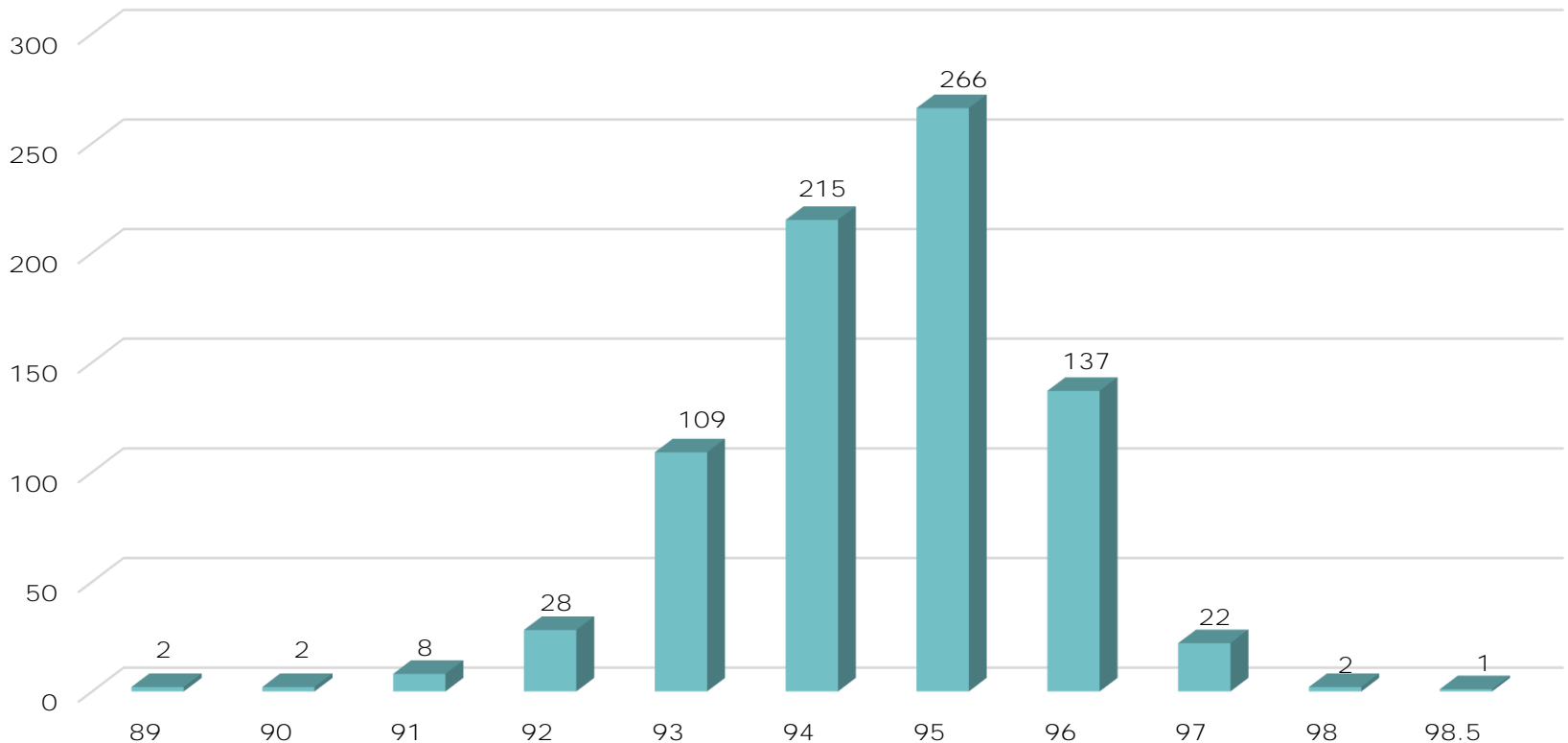
Lots	Total	AC	No.200	Density
Defective	2	2	0	0

2021 Statewide Density Distribution Wearing and Binder Courses – Ind. Increments



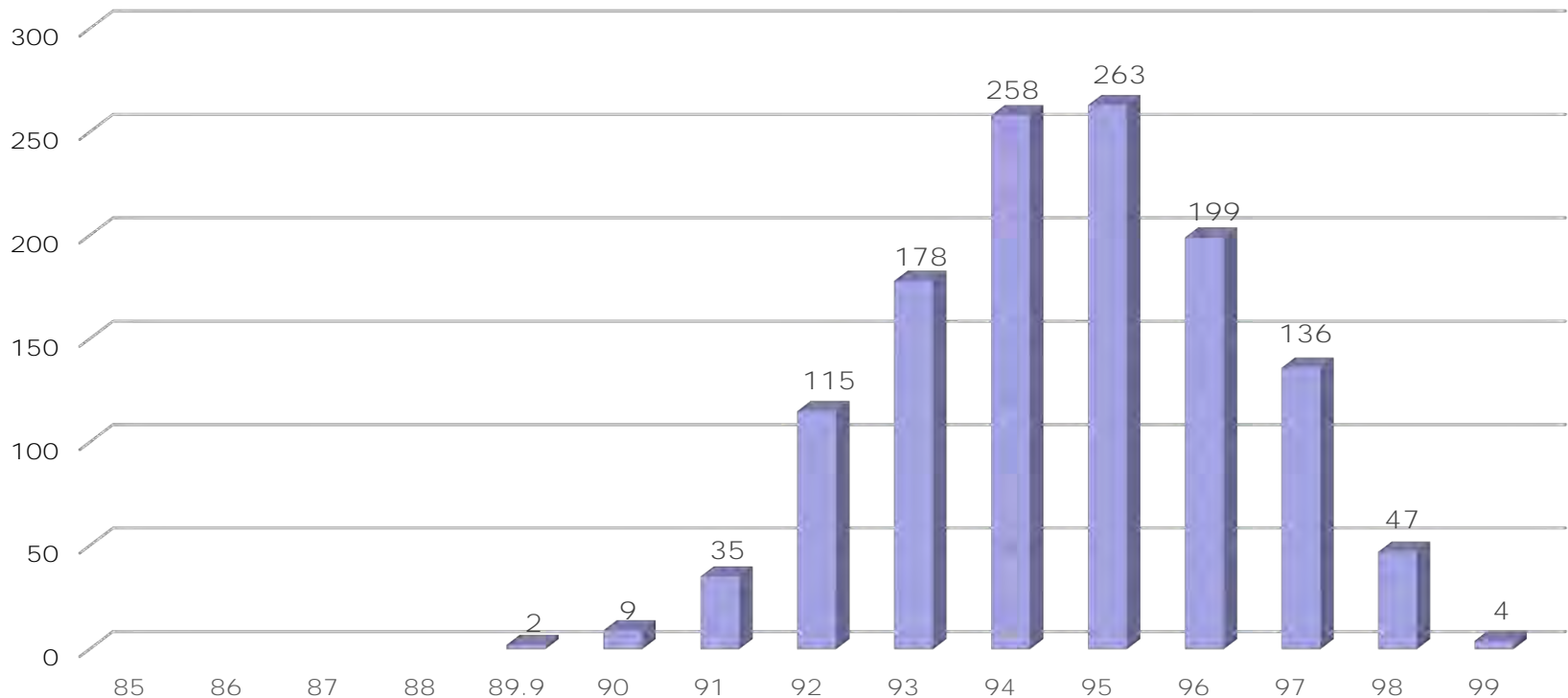
2021 Statewide Density Distribution Wearing and Binder Courses – Lot Averages

Total = 791

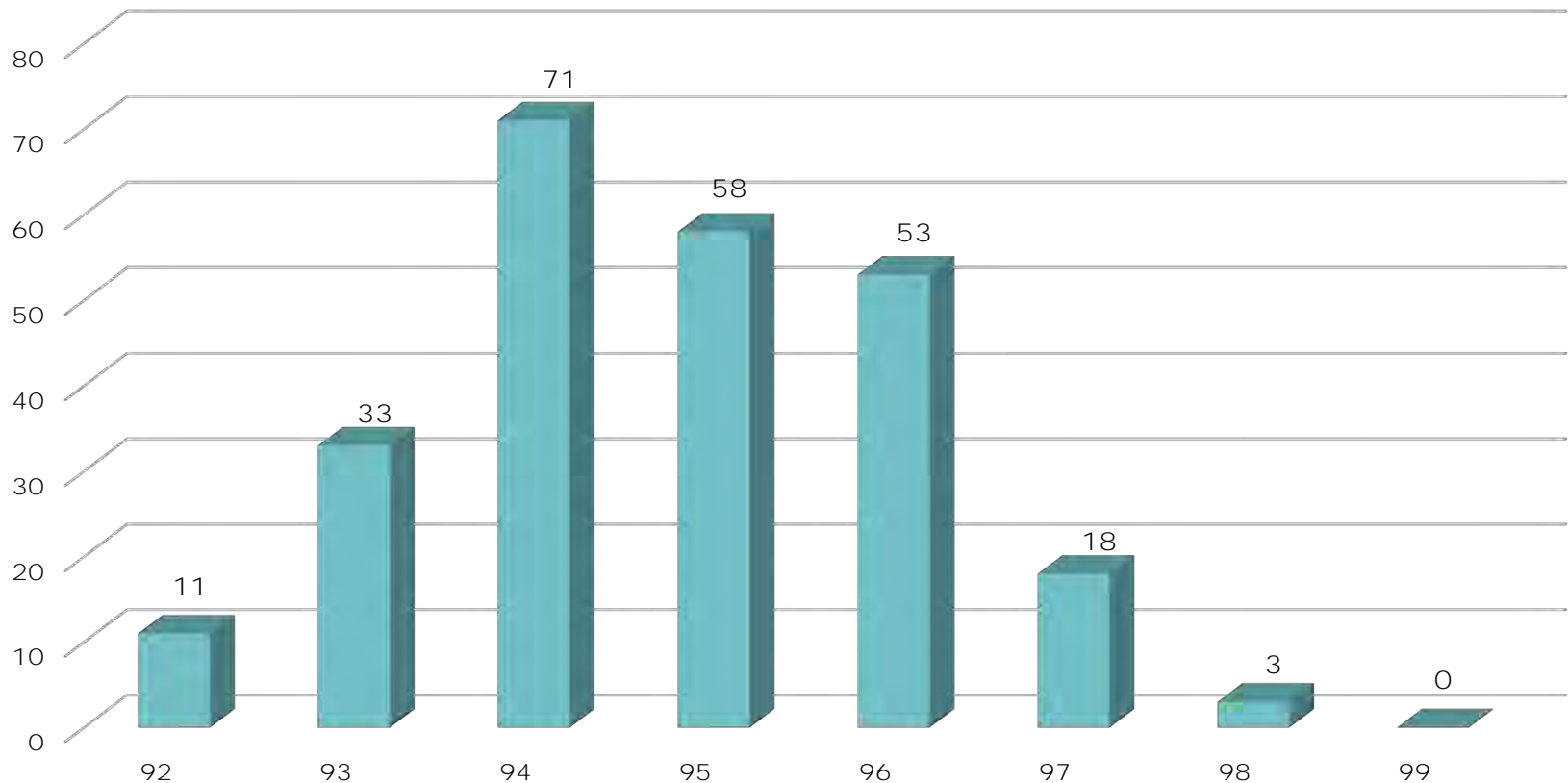


2021 Statewide Density Distribution Base Course – Individual Increments

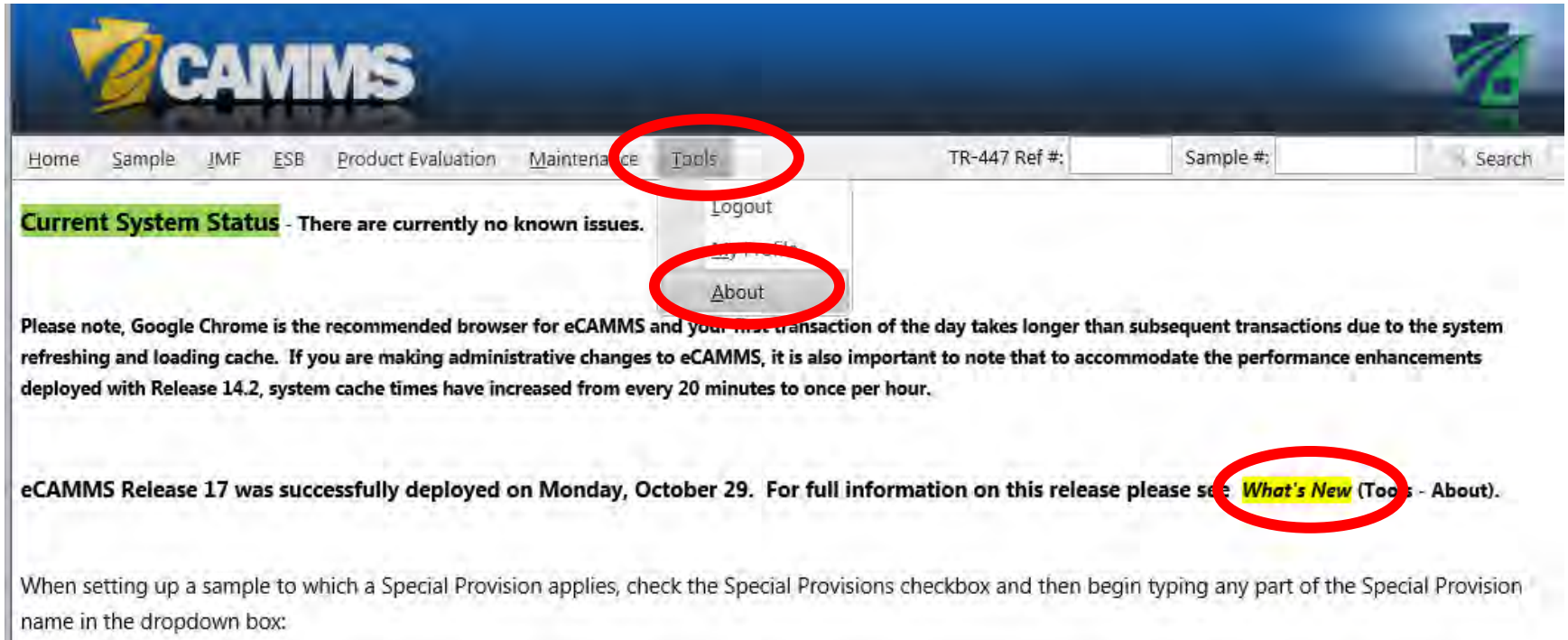
Total = 1246



2021 Statewide Density Distribution Base Courses – Lot Averages



eCAMMS UPDATES



Home Sample IMF ESB Product Evaluation Maintenance **Tools** TR-447 Ref #: Sample #: Search

Current System Status - There are currently no known issues.

Logout
About

Please note, Google Chrome is the recommended browser for eCAMMS and your first transaction of the day takes longer than subsequent transactions due to the system refreshing and loading cache. If you are making administrative changes to eCAMMS, it is also important to note that to accommodate the performance enhancements deployed with Release 14.2, system cache times have increased from every 20 minutes to once per hour.

eCAMMS Release 17 was successfully deployed on Monday, October 29. For full information on this release please see **What's New** (Tools - About).

When setting up a sample to which a Special Provision applies, check the Special Provisions checkbox and then begin typing any part of the Special Provision name in the dropdown box:

eCAMMS UPDATES Release 32

Release 32 ❖ September 2021

15

Sample General.....	15
Bulletin 15 Email Notifications.....	15
New Bold Messaging on the My Product Evaluations Page	15

eCAMMS UPDATES Release 30

Release 30 ❖ June 2021

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Sample General	15
Changing Distributed Sample When Containing an Inactive Party.....	15
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eCAMMS UPDATES Release 30

JMF Changes	17
Bituminous JMF – Add Legacy Fields	17
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Add Ability to Edit an Approved JMF	17
Add ‘Reference Data’ Functionality to Bituminous and Concrete JMFs	17
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Add Outlier Information Section to Client Report and Test Request Results	17
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QUESTIONS?



HIGH RAP MIXES FOR LOW VOLUME ROADWAYS

2022 PAPA Regional
Technical Meeting

OBJECTIVE



George W. McAuley Jr., P.E.
In Memoriam: 1962-2021

Develop a spec with high RAP that will result:

1. Reasonable cost savings
2. A product that will perform well on low volume routes

SPECIFICATIONS



- I. 19mm Binder Course
- Garth Bridenbaugh, P.E.

- II. 9.5mm Wearing Course

- III. 25mm Base Course

CREDITS



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SUMMARY – USE GUIDELINES

ALL 3 SPECIFICATIONS (9.5mm – 19mm – 25mm)

- 100% STATE FUNDED PROJECTS (NO FEDERAL FUNDS)
- NO NHS ROADWAYS
- LOW VOLUME = BPN-4 ROADWAYS
- MAX ADT LIMITATION
- **MAX ADTT LIMITATION \leq 300**
- NOT MANDATORY TO USE
- EXISTING JMFs WITH RAP $<$ 15% CAN ALSO BE USED

SUMMARY – USE GUIDELINES

ALL 3 SPECIFICATIONS (9.5mm – 19mm – 25mm)

- $N_{\text{design}} = 50$
- TWO TIERS OF DESIGN ESAL RANGES
- PG 58S-28 Binder for Tier II

MATERIAL CLASSES

- 9.5mm → WR9.5M
- 19mm → WR19BM
- 25mm → WR25BCM

DESIGN ESAL RANGES

- 9.5mm (WR9.5M)

- Tier 1 Ndes=50 RAP > 15-25%
- Tier 2 Ndes=50 RAP > 25-40%

- 19mm (WR19BM)

- Tier 1 Ndes=50 RAP > 15-30%
- Tier 2 Ndes=50 RAP > 30-50%

- 25mm (WR25BCM)

- Tier 1 Ndes=50 RAP > 15-25%
- Tier 2 Ndes=50 RAP > 25-50%

ADT AND ADTT LIMITATIONS

- 9.5mm (WR9.5M)
 - (ADT) \leq 2000
 - (ADTT) \leq 300
- 19mm (WR19BM)
 - (ADT) \leq 5000
 - (ADTT) \leq 300
- 25mm (WR25BCM)
 - (ADT) \leq 5000
 - (ADTT) \leq 300

MINIMUM THICKNESS

- 9.5mm (WR9.5M)
 - **Minimum design pavement thickness $\geq 1.5''$**
 - *The asphalt mixture's coarse aggregate Skid Resistance Level (SRL) shall comply with Bulletin 14.*
- 19mm (WR19BM)
 - **Binder/leveling course average depth $\geq 2.5''$**
 - *Do not use as final surface since mix has no SRL designation (requires subsequent seal coat, micro surface, etc. within one year of placement)*
- 25mm (WR25BCM)
 - Minimum design pavement thickness shall be according to PUB 242.

DESIGN REQUIREMENTS – 9.5mm

SKID RESISTANCE LEVELS

ADT	SRL
20,000 and above	E
5,000 to 20,000	E, H, Blend of E & M, or Blend of E & G.
3,000 to 5,000	E, H, G, Blend of H & M, or Blend of E & L
1,000 to 3,000	E, H, M, G, Blend of H & L, or Blend of G & L OR Blend of E & L
1,000 and below	ANY

DESIGN REQUIREMENTS – 9.5mm

TABLE HR
Gradation and Volumetric Superpave Asphalt Mixture Design Requirements for
9.5 mm Nominal Maximum Aggregate Size (NMAS) Wearing Course Meeting the
Alternate Modified High RAP Requirements of this Special Provision

RAP Percent by Weight of Mixture, %	Number of Gyration at Ndesign	Percent Air Voids at Ndesign, %	Virgin PG Asphalt Binder Grade	Aggregate Gradation Control Points for the No. 8 (2.36 mm) Sieve Size Min. – Max.	F/A (Dust-to-Binder) Ratio Range	Voids Filled with Asphalt (VFA) Range, %
>15 to ≤25	50	3.5 – 4.0	PG 64S-22 or PG 58S-28*	42 – 67	0.6 – 1.2	73–80
>25 to ≤40	50	3.0 – 3.5	PG 58S-28**	42 – 67	0.6 – 1.3	77–83

* Contractor may elect to use either PG 64S-22 or PG 58S-28 as the virgin asphalt binder grade in the asphalt mixture. No LTS evaluation of the asphalt binder in the RAP is required for asphalt mixture containing RAP up to 25% by weight of mixture.

** A different grade of virgin asphalt binder may be approved if the contractor chooses to have the asphalt binder in the RAP evaluated by LTS, and that evaluation shows that blending will achieve a PG 64S-22 grade at the proportions in the JMF.

DESIGN REQUIREMENTS – 19mm

TABLE HR

Modified High RAP Asphalt Mixture Design Requirements

RAP % by weight	Gyrations at Ndes	Air Voids at Ndes	Virgin PG Binder Grade	Min. % Passing the #8 sieve	F/A Ratio	Max. VFA
>15 to 30%	50	3.5 – 4.0%	64S-22 or 58S-28*	32%	0.6 – 1.2	77
31 to 50%	50	2.5 – 3.2%	58S-28**	32%	0.6 – 1.3	83

* Producer may elect to use either PG 64S-22 or PG 58S-28 virgin binder grade in the mix. No blending evaluation is needed for RAP up to 30% by weight.

** A different grade of virgin asphalt may be approved if the contractor chooses to have the asphalt binder in the RAP evaluated, and that evaluation shows that blending will achieve a PG 64S-22 grade at the proportions in the JMF.

DESIGN REQUIREMENTS – 25mm

TABLE HR

Gradation and Volumetric Superpave Asphalt Mixture Design Requirements for 25 mm Nominal Maximum Aggregate Size (NMAS) Base Course Meeting the Alternate Modified High RAP Requirements of this Special Provision

RAP Percent by Weight of Mixture, %	Number of Gyration at N _{design}	Percent Air Voids at N _{design} , %	Virgin PG Asphalt Binder Grade
>15 to ≤25	50	3.0 – 4.0	PG 64S-22 or PG 58S-28*
>25 to ≤50	50	2.5 – 3.5	PG 58S-28**

*Contractor may elect to use either PG 64S-22 or PG 58S-28 as the virgin asphalt binder grade in the asphalt mixture. No LTS evaluation of the asphalt binder in the RAP is required for asphalt mixture containing RAP up to 25% by weight of mixture.

** A different grade of virgin asphalt binder may be approved if the contractor chooses to have the asphalt binder in the RAP evaluated by LTS, and that evaluation shows that blending will achieve a PG 64S-22 at the proportions in the JMF


RAP Percent by Weight of Mixture, %	Aggregate Gradation Control Points for the No. 8 (2.36 mm) Sieve Size, % Min. – Max.	F/A (Dust-to-Binder) Ratio Range	Voids Filled with Asphalt (VFA) Range, %	Voids in Mineral Aggregate (VMA) Min, %
>15 to ≤25	25 – 45	0.6 – 1.3	69 – 81	13.0
>25 to ≤50	25 – 45	0.6 – 1.3	73 – 84	13.0

DESIGN REQUIREMENTS – 25mm

TABLE B1
Job-Mix Formula
Volumetric Tolerance Requirements of the Laboratory Compacted Mix for
Mixtures Meeting the Alternate Modified High RAP Requirements of this Special Provision

Property	Each Specimen	Multiple Specimens
Air Voids at N_{design} (V_a)	($\pm 2\%$) ⁽¹⁾	($\pm 1.5\%$)
Minimum VMA % for 25.0 mm	12.5	

(1) The $\pm 2\%$ tolerance only applies down to a minimum Air Voids at N_{design} (V_a) of 1.5%.



Since the minimum design VMA has been increased from 12.5% to 13.0% in 25mm High RAP SSP (Table HR), the minimum production VMA percentage that exists in Section 413, Table B has been increased from 12.0 to 12.5 to account for the 0.5% increase in minimum design VMA.

MATERIAL ACCEPTANCE

- 9.5mm (WR9.5M)
 - MATERIAL ACCEPTANCE: LOOSE BOX SAMPLES
 - DENSITY ACCEPTANCE: CORE SAMPLES
 - MAX PAY = 100% (NO BONUS AVAILABLE)
- 19mm (WR19BM)
 - MATERIAL ACCEPTANCE BY CERTIFICATION
 - DENSITY ACCEPTANCE BY ORP OR NON-MOVEMENT
- 25mm (WR25BCM)
 - MATERIAL ACCEPTANCE BY CERTIFICATION
 - DENSITY ACCEPTANCE BY ORP OR NON-MOVEMENT

ECMS PATH

The screenshot displays the ECMS interface with the following elements:

- Header:** "pennsylvania DEPARTMENT OF TRANSPORTATION ECMS ENGINEERING AND CONSTRUCTION MANAGEMENT SYSTEM".
- Navigation Bar:** "Business Partner", "Solicitation", "Engineering Agreements", "Construction Projects", "References", "Administration", "Work Q".
- Left Panel:** "STANDARD SPECIAL PROVISION" with a "Detail" section containing:
 - Index or Category: Provisional Specification R
 - Sequence ID: 4111
 - Version: B
 - Provision Name: c0413 ITEM 4413-0010 SU
- Usage Information:**
 - Measurement: English-IP
 - Edit Body: No
 - Edit Header: No
 - Edit Project Specific Details: No
 - Instructions for Usage: For use on projects with 100% State Funds Only. Not for use on NHS
 - Use in accordance with the letter titled "Use Guidelines for 19.0 mm High RAP Asphalt Mixtures for cabinet
 - 408 Section: 413
 - Effective From: 04/10/2020
 - To: 12/31/2999
- Right Panel:** A dropdown menu from "Construction Projects" with the following items:
 - Projects
 - Estimates
 - Work Orders
 - Site Activities
 - Source of Supply
 - Certifications
 - Visual Site Inspections
 - Mitigation
 - OJT
 - Resources >The "Resources >" item is expanded to show:
 - Asphalt-Diesel Prices
 - Item Price History
 - Master Items
 - Special Provisions (highlighted with a red box and a red arrow)
 - Steel Prices
 - Work Class Codes
 - Equipment Inventory
 - Standard Mitigation

ECMS PATH

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pennsylvania
DEPARTMENT OF TRANSPORTATION

ECMS

**ENGINEERING AND CONSTRUCTION
MANAGEMENT SYSTEM**

Business Partner Solicitation Engineering Agreements Construction Projects References Administration Work Q

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SPECIAL PROVISIONS PORTAL

Special Provison Search

* Previous search criteria * ▾ EXECUTE

- **Advanced Search**
- Special Provision Search by Description

ECMS PATH

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pennsylvania DEPARTMENT OF TRANSPORTATION **ECMS** ENGINEERING AND CONSTRUCTION MANAGEMENT SYSTEM

Business Partner Solicitation Engineering Agreements Construction Projects References Administration Work Q

Back Search Clear Help

STANDARD SPECIAL PROVISION SEARCH

Search Criteria

Index or Category: Provisional Specification Related

Provision Name:

Status: Active
Approved
Inactive
Pending

Include Instructions:

Saved Searches

* Previous search criteria * Save Search a

Click the Search button, do not click the EXECUTE button

ECMS Provision Names

- 9.5mm (WR9.5M)

- c04132 ITEM 9000-XXXX SUPERPAVE ASPHALT MIXTURE DESIGN, WMA WEARING COURSE, PG 64S-22, <0.3 MILLION ESALS, 9.5 MM MIX – MODIFIED HIGH RAP REQUIREMENTS

- 19mm (WR19BM)

- c0413 ITEM 4413-0010 SUPERPAVE ASPHALT MIXTURE DESIGN, BINDER COURSE (LEVELING), PG 64S-22, <0.3 MILLION ESALS, 19.0 MM MIX MODIFIED HIGH RAP REQUIREMENTS

- 25mm (WR25BCM)

- TBD

QUESTIONS?

Jay Sengoz

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